

V. 4 # 24
Aug 21, 1901
8.41

CURRENT NOTES AND COMMENTS

Colonel William P. Sheffield, Jr., a lawyer, appeared before the police commissioners of Newport, R. I., last Friday evening and requested them to prevent the proposed automobile races on Aug. 30, as they would be a breach of the law.

Colonel Sheffield spoke for about 20 minutes, stating that he had laid the matter before the attorney general of the state and that that official had advised him that the resolution of the city council which gave the National Automobile Racing Association of Newport the privilege of using the road was illegal. Basing his argument upon this opinion, Colonel Sheffield asserted that the proposed races would prove to be of the greatest danger.

R. C. Turner, of the National automobile association, answered Colonel Sheffield briefly, but as Mr. Vanderbilt had gone to New York, no adequate arrangements had been made to meet the points suggested in Colonel Sheffield's argument.

The police commission decided to take no action, but to hold the matter for advisement with the attorney general and the city solicitor. It is understood that the commission stands two to one in favor of the races, but it is probable that they would act in accordance with the law as interpreted by those whom they will consult.

On Monday the police commissioners met to consider the report of the city solicitor, who stated that, in his opinion, the commission had no power to stop the races, but might arrest all who took part in them for exceeding the speed limit of 10 miles an hour. The trifling matter of an arrest will not prevent the members carrying out their plans.

Edison Battery for Studebaker

At odd times there have been reports to the effect that the Studebaker factory, at South Bend, Ind., would engage in the manufacture of automobiles. Repeated inquiries have developed the fact that the company was waiting for something more definite to develop. It is now announced, however, that it is making two experimental vehicles and

has secured a promise of one of the first of the Edison batteries manufactured, to be applied to one of them. The other is in the hands of a representative of the Westinghouse company, of Pittsburg, which, it will be remembered, has a contract for the manufacture of the hub motors recently described in this paper. Both of the vehicles are express wagons. A representative of the Westinghouse concern has been at South Bend for the last two weeks.

French Machines Coming Over

Fournier will not race in America on the same vehicle which won the Paris-Berlin race, which was then and remains the property of a gentleman named Laycock. He has been loaned a vehicle by M. Levegh, said to be the strongest of the Mors lot, and Charron, having sold his Panhard, will sample the Buffalo-Erie highway on a racer lent him by M. Pinson.

The New York Herald quotes a French paper's article relative to the disposition of the big carriages which ran in the Paris-Berlin race. Most of them have been sold to foreigners. Frenchmen do not seem to fancy paying the high prices asked. Some will run in the great Buffalo-Erie contest, in which MM. Charron and Fournier are both entered.

Mr. Heath's 40-horsepower machine has become the property of Mr. Bishop, who is taking it across the Atlantic. Some changes, however, have been thought necessary to suit the imperfections of American roads. The whole frame of the carriage has been raised, so that the driving wheel should not jar against the roadway where the ruts are deep.

Some carriages sustained a complication of injuries. The one which bore Fournier to victory was scathless. It remains the property of Mr. Laycock. Maurice Farman's Panhard was sold by him to Herr Jellineck, manager of the big automobile works in Germany, for 50,000f, and by him resold for 40,000f to M. Charley, who promptly disposed of the machine for 50,000f to a third purchaser.

Henry Farman's automobile remains in

NOTES AND COMMENTS.

France. It has been bought by Stephen Rives, brother-in-law of M. Desmarrais, the gasoline manufacturer. Charron's is said to have been disposed of for 80,000f to M. Maigret, and M. Girardot's to Baron Henri de Rothschild. Prince Orloff has become the owner of the 40-horsepower vehicle piloted by Chevalier de Knyff. MM. Leys and Jarrott sold their respective carriages to Lord Carnarvon and Harvey du Cros.

Across the channel will also go M. Paul Chauchard's 40-horsepower, which was bought in the first place by M. Lamberjack and quickly resold to Mr. Avery for 50,000f. Until further orders MM. Gilles Hourgieres, Mors, Levegh, Rolls, Voigt, Pinson, Clement, de Crawhez, Boson de Perigord and Loysel remain in possession of their racers, although tempting offers have not been lacking.

Olds Company Will Remove

Detroit, Aug. 17.—This city has lost the Olds automobile factory. The officials have signed a contract to move to Lansing. They say that labor troubles are responsible. It was further stated that at present there was a far greater demand than supply for skilled labor in Detroit, a condition which would be a rarity in a small town. The Merchants & Manufacturers' Exchange appointed a committee to look into the questions, but has no hope whatever of retaining the Olds concern. By the removal, which is to formally take place next January, Detroit will lose a factory that employs 150 men and is shortly to increase to 500. The present factory site on Jefferson avenue, which adjoins the Detroit Stove Works, has greatly increased in value since its purchase by the Olds company, and will probably be sold to the stove company.

Chicago Club Enthusiasm

Chicago's automobile club is to become a real live institution. Heretofore it has been a lingering affair. It has 100 members. The directors have pledged themselves to get 100 more before the first of January. It has club rooms. The directors have determined to make it a house. It has done little or nothing to increase the interest in automobilism. It will do a great deal, some of the details of which are available for immediate publication and some of which will have to keep until plans are matured.

All this was decided at a meeting of the board of governors on Monday evening. There has been no meeting either of the board or of the club for some weeks, never, in fact, since the Eddy incident. On Monday, however, the secretary managed to secure a good attendance, and everyone present agreed that it was the best meeting the club had ever held.

First of all the resignation of Mr. Eddy was accepted. Then Mr. Donald, who has been first vice, and Edwin F. Brown, who has been second in command, were each promoted. Mr. Bate was added to the board to fill the vacancy caused by Mr. Eddy's retirement. Then the matter of adding to the membership was discussed, with the result above referred to. A discussion of club house plans followed. The members were unanimously of opinion that it would be possible to secure a house early in the spring if not sooner. Then came a discussion of plans arranged by Motor Age for a tour to Buffalo. It was voted, unanimously, to accept a proposition made by this paper to take charge of the run and conduct it in the name of the club. It is likely that the dates originally set for the event will be changed to the eight days following Sept. 6. A committee was appointed, of which C. H. Tucker, of the Locomobile Company, is chairman.

Test Under Best Conditions

Several makers of automobiles who, at the invitation of this paper, recently expressed their opinions relative to the promotion of endurance tests, made the point that the tests would be deceptive because makers would build special vehicles, place them in the hands of the most expert operators and do all other things possible to insure their going through the ordeal. How well this estimate will be carried out in the coming endurance test between New York and Buffalo is shown by the first official announcement sent out by a manufacturer. It comes from the Stearns company, and is to the effect that the designer of the machine, who will, of course, be able to quickly remedy anything that may go wrong, will be accompanied on the run by a gentleman whose fame as a racing man in steam vehicles is excelled by none in this country. No one will blame the makers for their selection of

NOTES AND COMMENTS.

operators in this case, for the chances are that nearly all the makers who will participate will do the same thing, but the incident splendidly illustrates the difference between what may be expected of carriages of all types in the coming event and in a trip of the same kind in the hands of less skillful operators.

Value of Two-Cylinder Motor

E. B. Gallaher, manager of Searchmont Motor Co. and L. S. Chadwick had an interesting experience on a run which they made to Atlantic City. The pair made 30 miles in about 1½ hours. Suddenly a peculiar sound was heard and upon investigation it was found that the admission valve on one of the cylinders had broken, had worked itself into the compression space and when the piston came up, wedged between the piston and cylinder head, breaking the former. An accident of this character usually means shipping the machine by rail. The vehicle in question was one of the double cylinder 12 horsepower Searchmont gasoline carriages which has been so arranged that the cylinders may be operated separately. In about 15 minutes adjustments were made and the trip was resumed with one of the cylinders out of service, giving 6 horsepower with which to complete the trip. The balance of the trip was made without accident at an average speed of 11½ miles an hour.

Severe Sentence in France

A correctional court of Paris has just rendered a verdict which has set the entire army of automobilists afire. The sentence is two months in jail and \$12,000 indemnity to the victim, Clement Arramy, who, on the Avenue de la Grande Armee, was run over and killed by a vehicle conducted by Bernin, a mechanic of the firm of Charron, Girardot & Voigt. George Prade, who witnessed the accident, writes as follows to the *Auto Velo*:

"I assisted personally at the accident. I offered Bernin to serve as a witness, and I regret that he did not cite me to appear. It does not seem to me that he knew at the time of the accident with what fierceness he would be prosecuted. It is most probable that had he been tried before the accident of Rheims (Paris-Berlin race) he would have been set free. Arramy was

coming down the avenue on his bicycle, on the right side, as is the rule. Bernin was behind him, and pressed his cornet to let him know that an automobile was there. Then, logically, and as was his right, he went to his left with the intention of passing. Arramy got frightened and took to the left in front of the vehicle, crossing only a few meters in front of the wheels. The automobile was going so slowly that Bernin had time to stop it, but owing to the mud it slipped a little. Arramy also slipped, and although hardly touched by the mud guard of the vehicle, which was standing still, fell and fractured his skull. I think of a cabman, willingly running so near a cyclist as to cause him to fall, be run over and severely hurt, and all he got was 15 days in jail. How will it be in this case, which the Temps reported last night: 'Last night an automobile going from Belfort to Bale (Switzerland) was struck by the express train from Paris to Mulhouse. Mr. Zuck, the driver, was killed.' Well, this time, I am sure, Mr. Zuck will be blamed."

Climbed Pike's Peak

W. C. Felker, the Denver agent, and C. A. Yont succeeded, last week, in climbing Pike's Peak in a Locomobile. The distance was 14 miles. The road between Cascade and the summit is in bad condition, cut by gullies and washouts and badly obstructed in places by boulders and dead trees.

Frequent stops were necessary and much hard shoveling and chopping had to be done before timber line was reached, but after that the ascent was comparatively easy. The top was reached in the middle of the afternoon. The descent was more difficult and nerve wearing, but the two travelers reached Manitou without serious mishap late at night.

Felker wired the makers from the summit of the mountain announcing his success.

It took the pair 9 hours to reach the summit and 4 hours to return. Beyond the Halfway house riding in the machine was out of the question. Felker and Yont dismounted, and with a full head of steam on the engine put their shoulders to the machine and, between steam and man power, lifted the locomobile clean over huge

NOTES AND COMMENTS.

boulders and finally reached the summit. There they lay on their backs too much exhausted to move, although a raging snow storm swirled about them and the cold froze their ears.

The most perilous part of the trip proved to be the descent. Leaving the peak about 5 o'clock, they barely reached the Half-way house before dark. The road was invisible. While Yont stumbled along ahead, feeling the way and shouting directions or warnings, Felker endeavored to control the machine, which pitched over the rocks as dizzily as a ship at sea. There were times when the wheels ran along the edge of precipices, or climbing the side of a cliff threatened an upset. In one place it plunged off a ledge, breaking a front spring and very nearly crushing Yont. At Windy Point it was only by hanging their mackintoshes about the burner that the fire was kept from being blown out.

Both men reached Cascade in a state of almost total collapse, but set out Tuesday morning and made the run back to Denver.

Care of the Water Jacket

A useful hint is contained in an article written for the Automobile by Earl P. Mason, who, discussing water jacketing of gasoline motors, remarks that there are two drawbacks, "first, the danger of some water leaking into the cylinder due to bad gaskets at the joints, and, second, the danger of the water freezing in the jacket in winter when the machine is standing still. To those who have had experience with water in the cylinder I need say nothing, but to the novice I may explain that a very small amount of water, not much more than a teaspoonful, in the cylinder or closed crank case will make the motor run very irregularly, if it does not stop it altogether. For this reason it is advisable to have a pet-cock in the bottom of the crank case, where accumulated water and oil may be drawn out. Water in the crank case is not, however, always an indication of a leak in the water jacket, especially on two-cycle motors, where the air and gasoline are mixed in the crank case, for the rapid vaporizing of gasoline produces cold, and if the air is moist upon entering some of the moisture will be condensed in the crank chamber. The freezing of water in the jacket would be very liable

to crack the cylinder; therefore, great care must be taken to drain this out in cold weather. Anti-freezing compounds, such as common salt and chloride of calcium, have been dissolved in the water, but one must be careful about using anything that will have corrosive action on the iron of the cylinder or that will leave a sediment in the passages and so abstract the same. Glycerine has been used and found to act very well. It is readily soluble in water and has no corrosive action on the metal; and as the water evaporates the glycerine is left behind, so that one charge of glycerine will last for several fillings of the water tank."

Chicago Loses a Good Man

Milton J. Budlong, formerly of Chicago, has been called to New York to assume the management of the Riker factory of the Electric Vehicle Co. Mr. Budlong's connection with the automobile industry was detailed at some length quite recently. From a salesman for the Pope Mfg. Co. he became the manager of the Chicago branch. When Mr. Day, formerly of the Pope company, became president of the Electric Vehicle Co., he offered Budlong the management of the Siemens-Halske plant, which was accepted. When the Electric Vehicle Co. decided to open a Chicago branch, Budlong was, of course, selected as its manager. Two weeks ago, however, he was called east and offered the position which he now goes to fill. His career has been a remarkable success, a fact at which none who knows him will wonder. The position vacated will be filled by G. W. Atkins, who, until the late change, was general western representative of the concern. It is reported that one or two other people from the Chicago branch will be offered positions in the east.

Had to Pay for a Tow

"The worst medicine I ever took," laughed an automobilist, "was administered to me by an old farmer. One day I was spinning along a country road when I overtook a lank pumpkin roller jogging along behind a sleepy old horse. As I came up anger seemed suddenly to flash from his eye, and he stood up in the wagon and whipped the old steed down the road for all it was worth. 'You can't do it—you can't do it,' he kept howling through the dust. I teased him a little by giving him

NOTES AND COMMENTS.

the lead; and then forged majestically ahead, leaving him far down the road. 'I'll beat you yet, you dude!' he shrieked as I left; and then I almost forgot the incident. But I soon had occasion to remember it. A little further on I suddenly came upon a steep, sandy hill. The machine plowed half way up, shivered, and stuck. I soon heard a familiar rattling down the road behind me, and then the plod, plod of the old farm horse. The pumpkin-roller drove right on up the hill without even looking at me, while he chewed a long straw in a sarcastic sort of way.

"Hey!" I called in desperation, 'give me a lift.'"

"Oh, it be you, be it?" he drawled, pulling up. 'What's the matter?'

"I want you to pull me up the hill."

"Wall, it'll cost you something, Mr. Horseless, for I'm in purty much of a hurry," he replied, dryly.

"Well, I had to pay that old cuss big salvage for towing me up the hill, and it gave him the keenest joy of his life to do it."

Another Wire-Lined Tire

The Elder Patent Tire Co. has been formed at Springfield, Ill., with a capital of \$25,000. The larger part of the stock is held by Samuel Elder, who has patented a tire for bicycles, automobiles and vehicles. This tire looks like the ordinary pneumatic, but inside the outer rubber is interwoven wire, which will not fall if punctured. Mr. Elder claims to have used it for four months, riding every day, and the tire is perfect. It is to be hoped, however, that the promoters will not waste a great deal of money in such an enterprise.

An Anti-Leak Compound

A patent has been granted to William H. Simmons, of San Jose, Cal., on a composition for closing tire punctures which he describes thus: Crude petroleum oil, two-thirds of a gallon; liquid asphalt prepared from asphaltic petroleum, one-third of a gallon; balsam of fir, four ounces; white lead ground in linseed oil, one pound; any good make of varnish, two ounces; castor-oil one ounce; raw linseed oil, one-half ounce; olive oil, one and one-fourth ounces. These ingredients are mixed at a temperature of from 120 to 180 degrees

of heat, being stirred continually while mixed. In the place of the castor oil, raw linseed oil and olive oil, any essential oil may be used, the object of the oil being to prevent the other ingredients of the composition from evaporating and becoming hard.

This is to be injected through the valve stem, about one-fourteenth of a gallon to tire; will remain soft indefinitely; will not interfere with repairs and is not affected by climate, so the inventor declares.

New Industries and Corporations

Empire Auto Repair & Storage Co., New York; capital, \$1,000; directors, James Wood, Jr., E. J. Mahedy, Brooklyn, and Florence Douglass, Jersey City, N. J.

Hart Cycle and Automobile Co., Philadelphia; capital \$50,000; to deal in automobiles, etc.; principal office, 647 Market street, Caden, N. J.

The American Carbon Motor Co., Buffalo; to manufacture and deal in machinery; capital, \$100,000; directors, William T. Thompson, J. L. V. Wood, Henry H. Ball, J. Nelson Frierson and Lyndon D. Wood, Buffalo.

Lane Bros. Co., Poughkeepsie, N. Y.; to manufacture motors and vehicles; directors Wm. J. and George Lane and J. M. Janes, all of Poughkeepsie.

Elder Patent Tire Co., Springfield, Ill.; to manufacture non-puncturable tires; capital, \$25,000; directors, Samuel Elder, president; J. R. Miller, vice president; J. D. Constant, secretary, and J. V. Jefferson, treasurer.

Obesity Defeated Royal Dignity

Ex-Queen Isabella of Spain, who is, in unprejudiced eyes, the fat woman of Europe, but who, being a personage, has her monstrous shape simply called obese, says the Boston Globe, has lately taken to motor cars—no carriage horse being equal to the task of pulling her about—but with melancholy results. Her majesty's automobiles are always breaking down. The other day she started to make the trip of 50 miles from Paris to a beautiful place she has rented for the summer, in her motor car; but at the last hill the machinery balked, and refused to budge another step. Isabella was forced to dismount, and be boosted into a farm wagon, the only vehicle at hand, and in this ridiculous and

NOTES AND COMMENTS.

ignominious fashion she arrived at the village, en fete to welcome her! Let the curtain discreetly fall over that royal descent, but if you have ever seen a bowlful of jelly tipped upside down, you know how her majesty looked as she backed over the tail-board to terra firma.

Important Fixtures

Sept. 26-28.—Three days' race meet of Buffalo Automobile Club, Fort Erie track. F. W. Peckham, secretary, 672 Main street, Buffalo.

Sept. 6.—Start of Chicago Automobile Club's tour to Buffalo.

Aug. 30.—Races at National Automobile Racing Association, Newport, R. I. G. F. Baright, secretary.

Sept. 16-21.—Endurance test of Automobile Club of America, New York to Buffalo.

Sept. 20.—Erie-Buffalo 100-mile road race.

Nov. 2-9.—Second annual automobile show at Madison Square Garden, New York.

More Tall Climbing

The London Daily Mail's correspondent at Geneva reported, last Thursday, that two American automobilists, named Anchor and Friars, had invaded the sanctity of the summit of St. Bernard, having climbed it from Martigny, to the amazement of the monks.

An Unusual Accident

The chain of a steam vehicle, operated by Howard Johnson, of Navesink, N. J., broke and struck the gasoline pipe, breaking a connection. Result, an immediate escape of oil and a serious fire.

The necessity of good gasoline in steam vehicle use was exemplified in a trip lately made to test a new machine made by the Steamobile Co. of America. On the outward journey, with good oil, the trip was made with three gallons less than the return, when the travelers had to rely on poor stuff bought at local stores. The trip of 100 miles, over poor roads, was made in less than 9 hours.

Manager Hill of the Toronto Exposition seems determined to carry through a race between Buffalo and the Canadian city, previously referred to in these columns. The plan is to have vehicles start from each city simultaneously, the winner to be the

one which reaches the halfway point first. A novel idea, but not encouraging to prospective spectators.

Some months ago a number of Chicagoans had several steam vehicles built from plans drawn by a local designer. The power proved insufficient. Now Dr. Pine, who owns one of them, is about to have it transformed into a gasoline vehicle. L. Elliott Brookes, of this paper, has made the plans, and the work will probably be done by the Truscott Boat Co., of St. Joe, Mich. If the first vehicle proves satisfactory the owners of the others will give similar orders.

The first automobile funeral on record, it is said, occurred at Coventry last week on the occasion of the interment of an old employe of one of the automobile companies. The hearse was a specially constructed 6 horsepower car. All the three cars used were draped with black. People who know Coventry and its people will probably wonder that such a 20th century innovation could possibly have received sanction in the old 18th century town.

Reports from England indicate that the power of cars is to be generally increased. Makers who formerly considered 3½ horsepower sufficient are now going in for 5 horsepower and others in proportion. A correspondent calls attention to the fact that the average maker now makes a machine with a motor of about the same power as was used for a Daimler wagonette a few years ago.

The Toledo Automobile Co. will erect a livery stable, in the west end, for the storage of machines, having found the present location too far from the residences of many of its customers. The company will retain its present quarters, but will be prepared to do repairing and all other things necessary at the branch.

The Atlantic Tube Co.'s plant, at Beaver Falls, Pa., has been sold by the receiver. The property was bid in by Samuel L. Robertson, of Pittsburgh, for \$300, subject to two mortgages, aggregating \$175,000. The works have been closed for a month, pending the sale, but it is thought will be started soon.

Commander Wells, of the London fire department, has started making a self-propelling engine as an experiment, believing that by the purchase of parts he can beat

NOTES AND COMMENTS.

the price of manufacturers who might undertake to supply the complete machine. The experiment is likely to be expensive to the department if it is paying the bills.

The mayor of Urbana, Ill., has ordered the automobiles which have been running between that city and Champaign to stop on account of the noise they make. They are said to frighten horses and to be a menace to the public safety. The council has instructed the corporation council to draft an ordinance restricting the use of automobiles to certain streets. There's a fine chance for a successful argument for some one looking for fame.

The authorities of New York have decided that the Mobiles running in the public service must pay a fee of \$5 each. Mr. Walker has, therefore, taken out licenses for six vehicles. Incidentally he secured a splendid advertisement out of the discussion of the question with the city authorities.

MOTOR AGE has supplied the New York Herald, at that paper's request, with photographs of a number of the automobiles and their owners entered for the New York to Buffalo contest. The New York daily papers are preparing to give the affair plenty of publicity.

Another Chicago man has bought and now has in this country a big Panhard machine. He is E. B. Shaw, a brother of Robert Shaw, who became famous by his ride from New York to Chicago, and now has the machine at Atlantic City.

A number of cities seem to be competing for the Milwaukee Automobile Co.'s factory. Endeavors are being made in a number of directions to raise money to build such a plant as the company desires.

An effort is being made to arrange a race between the Panhard machines owned by Messrs. Gates, Shaw and Armour, to take place at Washington park some time in September.

Up to Monday of this week information of the number of entries for the endurance run was refused. It was stated that details would probably be given out early this week.

A paper published at Santa Rosa, Cal., says that an automobile factory is to be established there and that a sample steam vehicle will be ready to be tried in a few days.

It is now reported that John Brisben Walker is one of the principal backers of the company which expects to operate vehicles in the public service at Wilmington, Del.

Two hundred Frenchmen were taken before a magistrate in one day. He fined them all lightly and gave them warning not to come before him again.

The Columbus club, which seems to be made up of enthusiasts, has now 16 members, and at its next meeting will admit six more.

New York, Aug. 21.—(Special telegram.)—The Buffalo-Erie 100-mile road race, which had been scheduled for Sept. 20, and for which the Pan-American people had offered a trophy in addition to the \$1,000 which the Automobile Club of America had agreed to add to the sweepstake has been postponed. The club has found it impossible to secure the necessary municipal permission, but its officers say the race will take place elsewhere, some time in October, and that efforts will be made to add still further to its international character.





FROM CORRESPONDENTS



Dunkirk, N. Y., Aug. 15.—To the Editor: I am convinced, after two years' trial, that the use of such light machines as some of those offered is all wrong. A year ago I had a smash-up, due to a defective street. The machine stood the test fairly well, considering its light weight, but it cost me a good many dollars before it was in condition to use again. Then I bought a heavy vehicle, gasoline. A month ago I went into a similar hole. The motor didn't stop, the vehicle backed out without a sign of difficulty and, so far as I could discover, not so much as a thread was stripped. Boy-like, I have given the machine some hard knocks since that to see what it will stand. I haven't reached the limit yet. When I do I'll tell you about it for the benefit of readers. My first machine weighed 850 pounds and my latest 1,800.—Yours, etc., L. R. Mann.

Harrowing Experience of a Beginner

Stanwick, N. J., Aug. 10.—To the Editor: In reading the letter of Mr. Charles D. Miller, in your issue of the 8th, it occurs to me that an exchange of experiences of automobile owners, not only with their carriages but with manufacturers, might make interesting reading, serving as a finger-board for others about to join the ranks and pointing out what to avoid in the choice of a carriage, for in this choice more than anything else—given that the driver is sufficiently intelligent—lies the determining factor whether the purchaser becomes a permanent convert or whether, after an experience of a few weeks or months, his carriage is offered for sale, "good as new," after "running but a few miles," with "satisfactory reasons for selling."

Early last season my choice fell on a steam vehicle, the makers of which promised everything for it short of human intelligence. I visited the factory, was treated courteously, the carriage was shown me

running, and I was "tickled to death" with it. I paid \$200 down and signed an agreement to pay the balance when the carriage was ready, this agreement covering certain extras, such as top, rubber bucket, storm apron, odometer, etc., etc.

Long after the carriage was promised, and after repeated urging, I was notified that they had on hand a carriage similar to that ordered, which I could have immediately. I visited the factory, tried the carriage, found it all right from the greenhorn's standpoint, handed them a certified check, and was told that the extras were not ready, but could be bought anywhere on the road home. As the proper official was not at hand, the difference due me could not be paid, but a check was promised by mail. I arranged for an expert to accompany me home, about 100 miles, at \$3 per day and expenses.

We left the factory at 7 o'clock Thursday morning, and after a run of three miles were compelled to stop at the top of a long hill owing to water being low. Runner thought check valves were not working. Boiler was emptied, water system cleaned of brass filings, and then we waited about half an hour for water to pump into the boiler. Becoming tired, we turned the carriage around and coasted down hill, without steam, the pump filling the boiler.

We steamed up and made another start. Proceeding about two miles, we alighted and found boiler burned out. We pushed the carriage half a mile to a farm house, and the runner spent about two hours expanding tubes, after which we again started. Inside of two miles one of the "seamless cold-drawn tubes" was found to have burst in the seam. After patching, I hired a passing teamster to pull us to the nearest hydrant, where we filled. In the next mile, fearing another burned out boiler, as pump was not working properly, we turned out

FROM CORRESPONDENTS

our fire, and hired another team to haul us to the nearest machine shop. The water system was found so defective we had an entire new lot of check valves and partly new piping put in, the runner asking me to pay the bill, the amount to be refunded to me by the manufacturers.

We finally left the shop about 4:30, and were then about 10 miles from the starting point, having averaged about one mile per hour. From this point on our troubles were ended for the day, except that we were thoroughly drenched by a storm, having no storm apron.

We stopped about 8 p. m. and started again Friday morning. About 11 a. m. could not make steam enough to run on a level road. We pushed the carriage to the nearest repair shop, where we took the whole system apart, without discovering anything amiss. We re-assembled, and the carriage ran magnificently to within about 12 miles of my home, when something appeared to be wrong with the chain, and no adjustment could remedy the defect. I finished my trip by rail, returning Saturday. We found that nearly all the balls in one bearing were split and ball run was ruined. I sent the runner to Philadelphia, but Saturday being a half holiday, nothing could be done until Monday, when the carriage was finally put in shape, and we finished our run of 100 miles at 4:30 p. m. Monday, about 40 working hours at an average of 2½ miles per hour.

After waiting some days, and not receiving check for balance due or replies to my letters, I wrote the manufacturers, stating that I would publish my experiences in the trade papers if I did not receive remittance within five days. Inside 48 hours I received a check for about one-fourth the amount due, with a letter stating that a bill would be rendered me by following mail showing how the balance was consumed.

After writing them again for this statement, they sent me a bill in which they charged for the expert's time, 40 hours at 40 cents per hour, instead of 30 cents, and 40 hours overtime at 60 cents per hour, or a total of 80 hours for a run of 100 miles, declining to assume the cost of repairs en route, or to replace a defective throttle valve, cracked ball, split dash, etc., all of which were promised by their runner. I

found that the run of 100 miles had cost me over \$1 per mile.

As I became experienced I found wherein the rig was defective, and during the first six weeks I had the engine overhauled, piping and valves changed, a hand pump put on for filling boiler in an emergency, etc., which enabled me to get about 2,000 miles out of the carriage during the season.

My experience led me to believe that a mixture of brains with the working parts of this, and many other carriages, would give the buyer something with which he could be satisfied. Larger engines, with some method of taking up lost motion without rebuilding, larger water, air and gasoline tanks, larger and stronger piping, better check valves and larger tires would add much to the desirability of most of the steam carriages. A good independent pump for water and air pressure would relieve the runner of a back-breaking task. Last year on my first trip in the carriage I was surprised to find with what ease the runner could induce boys to do his pumping when air pressure was low. The boys enjoyed it from the prominence it gave them.

During the past winter I made a careful examination at shows and factories, and finally pinned my faith on the De Dion-Bouton, 5 horsepower. I have been using this, over all kinds of roads, without a mishap, and would not care to trade it for any carriage I have seen. The treatment received from the manufacturers has been so directly opposite to that received last year that I am recovering my faith in human nature. They have started out, evidently, with the intention of making their machines popular by having satisfied purchasers.—Yours, etc., J. S. Rogers.

Roads and Gasoline in Canada

Grand Rapids, Mich., Aug. 15.—To the Editor: I will give you a brief account of our recent trip from Grand Rapids to Buffalo and return. I made it to test the machine, one of the ordinary type, made by the Mobile Co. of America. I desired to know if one dare cut themselves loose from a repair shop to try their fortune on something beside paved streets. We traveled 953 miles, by way of Detroit, Windsor, St. Thomas, London, Woodstock, Hamilton and Niagara Falls. Between Grand Rapids and

FROM CORRESPONDENTS.

Kalamazoo we found 10 miles of deep sand. Any one desiring an exact description of the road may obtain it by writing to Mrs. Eddy. She marked the roads "ex," "g," "f," "b," meaning excellent, good, fair, and bad. If she happened to be driving on a very bad piece she marked it with an "H." One forgets the bad roads after they have traveled such splendid ones as we did from Windsor to Niagara Falls, a distance, as we went, of 310 miles. This is the old Talbot road, nearly all the way in sight of Lake Erie. I recall one interesting experience. Mrs. Eddy was driving. It was 2 o'clock of an exceedingly hot day. She noticed a cool-looking lane running up into the forest at right angles to the road. There was a steep hill to climb and the road was wet and slippery. The gauge showed 140 pounds. She began the ascent. The steam gradually fell to 120 pounds, the wheels revolved slower and slower until, half way up the hill, they stopped entirely and began to revolve in the opposite direction. She applied the brake, but it was not sufficient. At the right of the road there was a steep embankment, 30 feet to the bottom; at the left a narrow ditch four feet deep. She wisely turned the handle to direct our course to the left ditch, where we soon came to a sudden stop. After digging among the brush with a pocket knife we got a rail under the back spring and soon had the rear wheels up on a plane with the front ones. We had no accidents other than the breaking of one link in the chain and the collapse of one tire. I carried both, and repairs were soon made.

Our most annoying experience was inability to procure gasoline. Frequently it was 25 and often 50 miles between places where gasoline was kept. We carried five gallons with us. The quality of what we did get was bad. I paid 25, 30 and 35 cents per gallon. At Leamington I bought of a merry-go-round man, as he had contracted for the only five gallons in town. I gave him \$1 for the privilege of paying 35 cents for five gallons. Buying oil of a trust may be bad, but being compelled to buy of the only man in town who keep it is worse.—Yours, etc., Everett H. Eddy, M. D.

Small But Useful Details

Mankato, Minn., Aug. 16.—To the Editor: I trust the following may be of inter-

est to some user of an automobile. A friend of mine has a steam vehicle which sometimes works nicely when understood. His first trouble came when the fire caught in the tube below the burner. He was on a long grade, and was compelled to go to the top before attending to it. The fire damaged the brass in the burner, which meant a new one. He bought a Kelly, which has worked well.

To my knowledge this boiler has used soft water nine-tenths of the time, but a few days ago, although the boiler could be filled, it took a lot of work to get water to show in the glass. My friend's trouble meant labor for me, as he was quite new at the business. The reason the water would not come up in the glass was that the connection at the bottom had been almost closed by scale. This we cleaned out by water pressure, attaching a garden hose. After spending an evening riding he started home as his water supply was becoming low. He had a long hill to run up. The grade ran all the water to the back of the tank and took the water away from the intake to the pump. The machine was not used until the next day, when he filled the tank and pumped some water into the boiler by hand. He made a run of only five blocks and the water was low. Air in the pump was the cause of the trouble. Here, again, I got him going; blocked up the wheels, ran the steam down, got the air out of the pump, and all was well again.—Yours, etc., A. C. B.

Better Tuition for Beginners

Chicago, Aug. 17.—To the Editor: Why do not the makers of automobiles supply their customers definite, printed instructions concerning the operation of their machines, hints as to their care, the remedy of troubles they are likely to encounter, etc.? I own a gasoline vehicle of well-known make. At present I would not exchange it for anything except a heavier one of the same make. But a month or two ago I would almost have given it away, so disgusted was I with the troubles I encountered. And all because I, a man who knows no more and no less than a majority of buyers about machinery, had not been properly instructed as to its use.

From my observations I am convinced that even men who claim to be mechanics

FROM CORRESPONDENTS.

know none too much about gasoline engines. How, then, do the makers expect that we people who devote our time to entirely different pursuits may know where the dangers lie? I have had trouble with almost every part of my machine. Every one of them was the fault of inexperience and the failure of the maker to tell me a few things about its operation. Here is an example. After I had been running the machine two weeks and it was running splendidly I found it necessary to stop by the roadside to oil. Following the instructions given me, I put a certain quantity of oil into the crank case and started. In a few minutes I came to a standstill. I found my plug blackened, cleaned it, started again, and the same thing happened. Indeed, it happened a number of times, and in the end I started for home, having given instructions to a teamster to haul the machine back for me. Now, of course, nine out of 10 readers will smile and say I was a fool not to know enough to let the oil out of the crank case, but how should I know? Suppose I went to the maker of that machine and talked to him about some other business with which he had never had experience. Would he know what I was talking about or how to remedy something that had gone wrong? I think not. I don't believe I am absolutely without intelligence. I do believe there are others who have just the same troubles as I have had, solely because the makers do not take the trouble to instruct them. I believe the maker who makes a point of giving attention to this important detail will profit thereby. Yours, etc., M. A. S.

Successful Electric Buses

Wilkesbarre, Pa., Aug. 12.—To the Editor: We are running an electric bus line with perfect satisfaction to ourselves and our passengers. We have three buses, carrying 18 passengers each, and weighing, when loaded, about 7,000 pounds. On account of the great weight we encounter more or less trouble with the rubber tires. We find that in running such large vehicles over asphalt streets they crush the rubber to such an extent that they tear on the tread. We also put in a Riker electric survey for five passengers, and it has been a winner from the start. We rent it, with an operator, for \$2 an hour. It has a 50-mile

battery, and the cost of operating has averaged about \$7.34 per month for power. —Yours, etc., Porter Bros.

To Prevent Freezing

Cleveland, Aug. 17.—To the Editor: Mr. Bishop's plan for retaining heat by stopping the draft when his machine is at rest can be applied to a gasoline vehicle also. I have had a glass screen made which, in cold weather, can be attached to the front of the top of the vehicle and brought down to the lower end of the framework thereof. I find it a great comfort when driving, and, by closing it tightly at the bottom, I have been able to leave the machine standing in cold weather for a long time without the water freezing. Experience only will tell how long it is safe to leave the machine under these conditions.—Yours, etc., R. L. Brand.

Ariel Company Retires

Goshen, Ind., Aug. 13.—To the Editor: Our company has discontinued business and its affairs have been liquidated in an honorable manner. You may kindly say to the trade that our stock of wheels was sold to the Beckly-Ralston Co., which also has the legal right to the future use of the name Ariel.

We thank you for your courtesy to the company during the years of its existence. —Yours, etc., Ariel Cycle Mfg. Co., Edwin W. Hawks, Manager.

Another Plan to Help Business

Paris, Tex., Aug. 15.—To the Editor: (If some one doesn't stop me Hoyland Smith will again be thinking that Mr. Bryan and I are trying to run the whole thing! However, there is another thing that has proven profitable to us. The writer made arrangements with the drug and cotton firms here for each of them to buy their errand boys bicycles, for which they paid us the regular price with the understanding that we keep these machines in repair at the regular price we charge every one else and on condition that we furnish their errand boys with wheels to ride while their own are being repaired. At present we have six customers on these terms. They each buy a new bicycle every year. Their average repair bill is \$2.50 per month each, and they are well pleased, and claim it is the cheapest and most expeditious manner of

FROM CORRESPONDENTS.

transportation for small packages they have ever had. The fact that it pays us is obvious from the above figures. But aside from this it puts the bicycle in good repute with a class of our best business people. Of course this scheme will hold good on any line of merchandise that has lots of errands and small packages to deliver. We began on the druggist and cotton firms because they afforded the best opportunities to demonstrate the worth of such a plan. However, we will add as many of every class of business to this as is possible.—Yours, etc., E. K. Baker.

Fauber Moves to Elgin

Chicago, Aug. 16.—To the Editor: Our attention has been called to a number of reports which have been sent out from Elgin, Ill., relative to our moving to that city, and in order that you may be properly informed in this regard we take pleasure in making the following statement:

We are about to incorporate our business, which will hereafter be known as the Fauber Mfg. Co. We have completed arrangements whereby we secure a large manufacturing plant at Elgin, to which point we have now begun moving. The new company will continue to manufacture hangers and specialties the same as heretofore, and in addition will take up a few other lines. In time we expect to manufacture automobiles, but we are not prepared to make public any statements regarding this at the present time. We hope to be running in our new location between the 10th and 15th of September. We believe the above covers all the facts in the case.—Yours, etc., W. H. Fauber, F. A. Burgess, Mgr.

The move above referred to, the first information concerning which was given the trade by this paper last week, means that the new company will have at its disposal about 55,000 square feet of space and such an assortment of machinery as to give it one of the best equipped plants the cycle trade has ever known. Mr. Fauber will hereafter reside in Elgin. Three car loads of machinery were shipped on Saturday and more followed on Monday.

Useful Suggestions

1.—Some time ago I had a lot of trouble to stop a puncture. A nail had gone into the tire diagonally. After trying every-

thing short of vulcanization I put in about two tablespoonfuls of common molasses. It stopped the leak almost entirely at once. Next day the leak stopped completely. That was three weeks ago, and the tire is holding air yet. (The Buffalo Specialty Co. makes a good preparation for repairs of this kind, called Neverleak.—Ed.)

2.—I had a small leak in the side of my water tank in such a position that it would have been a lot of trouble to solder it. I put about a handful of corn meal into the tank, filled it, and let the machine run until the water nearly boiled. The leak stopped and I have had no trouble with it since.

3.—A gentleman at Cedar Rapids, Ia., has ridden 18,000 miles on motor bicycles. He asserts that, properly made, they are suitable for all sorts of weather and all sorts of roads. Two machines gave way when he was riding at 20 miles an hour, due to the use of too light tubing. He finds that frames generally break at the tube from the head to the bracket and that in frames of the flush-joint variety they break close to the head.

4.—D. J. P., Chicago, complains that he has made a motor after the drawings by L. Elliott Brookes, published in *MOTOR AGE*, and that he fails to get more than 30 or 35 pounds compression. Investigation shows that he has failed to follow instructions in the matter of piston rings. He simply made parallel, circular rings, slotted them, and expected them to fit the cylinder. The rings must be made strictly according to instructions, else it will be found impossible to obtain the compression required.

5.—An unknown correspondent corroborates the statements of Mr. Bishop, in last week's issue, to the effect that, by using caps as therein shown for the flues of his steam vehicle, he not only prevents blowing back but, under some conditions, improves the draft and, by pushing the caps in when the machine is at rest, maintains heat and steam to a far greater extent than is possible while the flues are open and a draft passing up around the boiler and other parts of the machine.

W. J. Milner, Marietta, O.—No valve yet marketed will give a positive charge of the same quality at every stroke, regardless of speed. Such a device is badly needed, but the world has waited in vain, so far.

A SIMPLE AND EFFICIENT FRICTION CLUTCH

CONCLUSION.

Figure 10 shows three views of the clutch spider. This should be made of cast steel, though malleable iron of good quality may be used. On no account use brass or bronze, as they have not the required stiffness and there is too great a tendency of the jaws of the clutch spider to spring or be forced open from the driving action of the spider when the clutch is in use. A nice pattern is required and the lugs which carry the lifting links should be made in a core to facilitate molding. The places for the dovetailed slots which carry the clutch shoes should be left square and not undercut. After the spider hub has been bored and faced on both ends on a mandrel the dovetails should be put in. This can be very readily done in a shaper. The slots in the lugs for the lifting links should next be finished to size and the holes drilled for the pins. The keyway can then be cut. The feather keys used for these clutches are square, half in shaft and half in hub, measured in the center of the keyway, not at the edge.

The sliding shoes are shown in figure 11. They should be of cast steel and a pattern is required. The dovetailed or sliding part of the shoes should be finished to size first in the shaper, and after this should be put in place in the grooves in the spider, the spider and the sliding sleeve placed on a mandrel

with lifting levers and links in position and the outside or circular part of the sliding shoes then turned in the lathe to the dimension given in table 3. Headless set screws should be used for the adjusting screws and philister head for the clamping screws, which are used to lock the headless set screws in position after adjusting. Screws $\frac{1}{4}$ —20 are used for the No. 1, 5-16—18 for the No. 2, $\frac{3}{8}$ —16 for the No. 3 and 7-16—14 for the No. 4 clutch. The holes in the cir-

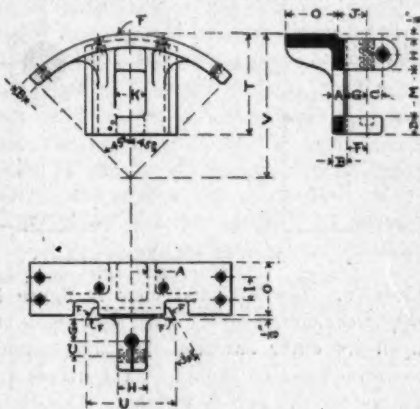


FIG. 11—SLIDING SHOE.
Two, cast steel.

cular part of the sliding shoes are tapped out for No. 10—32, 12—24, 14—20 and 16—20 flat-head machine screws for the respective sizes.

The vulcanized fiber which is attached to these shoes should be $\frac{5}{8}$ inch thick before turning down to proper size, which is $\frac{1}{2}$ inch thick. To properly bend this vulcanized fiber it should be steamed or soaked in hot, but not boiling, water, then placed in a clamp having the curve to which the fiber is to be bent. It should be allowed to dry thoroughly before removing from the clamp. The holes for the flat-head machine screws may then be drilled countersunk as shown in figure 2. The fiber should be of sufficient length to make an angle of 120 degrees, or, in other words, each piece of fiber should be one-third the length of the inner circumference of the clutch pulley before bending to shape. The flat-head screws should be let into the fiber so that their heads are at least

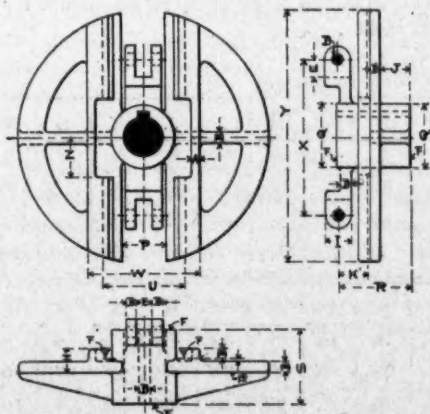


FIG. 10—CLUTCH SPIDER.
One, cast steel.

SIMPLE FRICTION CLUTCH.

3-16 inch below the surface of the fiber after it has been turned off in the lathe after fastening in position upon the sliding shoes.

The clutch pulley is plainly shown in figure 12 and should be made of high-grade cast iron and finished all over outside.

Figure 13 shows two other modifications of the clutch pulley shown in figure 1. It is intended to carry a sprocket wheel or gear on the outer portion of its hub, the spider in this case being the driver and the clutch pulley the driven member of the com-

shown in figures 10 to 12 for the four sizes of clutches.

In connection with this description it may be stated that if greater transmitting power is required than is given in table No. 1 it can be obtained by using a four-jawed spider instead of two jaws and making the circular portion of the sliding shoes 60 degrees instead of 90 degrees and the vulcanized fiber portion 75 to 80 degrees instead of 120 degrees. The writer does not advise the making of a three-jawed spider. They are not a mechanical balance, cannot

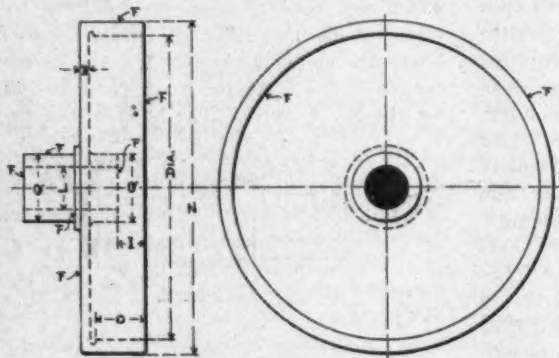


FIG. 12—CLUTCH PULLEY.
One, cast iron.

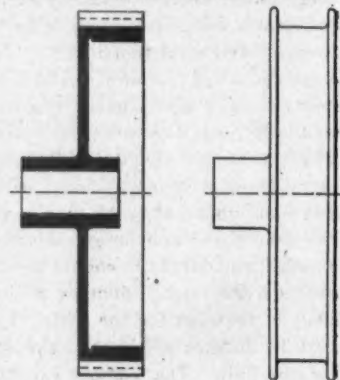


FIG. 13.

bination. The left-hand view in figure 13 shows the clutch pulley with gear teeth cut upon its outer surface. In this instance the clutch pulley should be the driver and the spider the driven member. The right-hand view in figure 13 shows the clutch spider with flanges on its periphery to use as a pulley for a belt if desired. The clutch pulley could, in this case, be either the driving or driven member.

Table No. 3 gives all the dimensions for the clutch spider, sliding shoe and pulley

be made so and will cause a great vibration if run up to speed exceeding 150 to 175 revolutions per minute. The clutch described will, if properly made and adjusted, give satisfaction, but, as before stated, it is not intended to be used as a speed changing or slowing device, but simply to engage and disengage a driving from a driven part of a machine without shock or jar or injury to the working parts.

NOTE.—In table No. 2 of last week diameter of clutch given as $9\frac{1}{4}$ inches should read $9\frac{1}{2}$ inches.

TABLE No. 3.
Dimensions—Figs. 10 to 13. Inclusive.

Clutch Number.	Diameter of Clutch.	A	B	C	D	E	F	G	H	I	J	K	L	M
1	7 $\frac{1}{4}$	$\frac{1}{8}$	$\frac{3}{4}$	$\frac{1}{8}$	$\frac{3}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{3}{8}$	$\frac{1}{8}$	$\frac{3}{8}$	$\frac{3}{8}$	$\frac{3}{4}$	$1\frac{1}{8}$	1
2	8 $\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{8}$	$\frac{3}{8}$	$\frac{1}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{1}{8}$	$\frac{5}{8}$	$\frac{3}{4}$	$1\frac{1}{8}$	$\frac{7}{8}$	$1\frac{1}{8}$	$1\frac{1}{2}$
3	9 $\frac{1}{4}$	$\frac{1}{8}$	$\frac{3}{8}$	$\frac{1}{8}$	$\frac{1}{2}$	$\frac{1}{8}$	$1\frac{1}{8}$	$\frac{5}{8}$	$1\frac{1}{8}$	$\frac{7}{8}$	1	1	$1\frac{1}{8}$	$1\frac{1}{4}$
4	10 $\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{8}$	$\frac{1}{2}$	$\frac{1}{8}$	$\frac{5}{8}$	1	$1\frac{1}{8}$	$\frac{3}{4}$	1	$1\frac{1}{8}$	$1\frac{1}{8}$	$1\frac{1}{8}$	$1\frac{3}{4}$

Clutch Number.	Diameter of Clutch.	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
1	7 $\frac{1}{4}$	1	$1\frac{1}{8}$	$1\frac{1}{4}$	$1\frac{1}{8}$	$1\frac{1}{8}$	$1\frac{1}{4}$	$2\frac{1}{8}$	$2\frac{1}{8}$	$3\frac{1}{8}$	$3\frac{1}{8}$	$3\frac{1}{8}$	6	8
2	8 $\frac{1}{4}$	$1\frac{1}{4}$	$1\frac{1}{8}$	$1\frac{1}{4}$	$1\frac{1}{8}$	$2\frac{1}{8}$	$2\frac{1}{8}$	$2\frac{3}{8}$	$2\frac{3}{8}$	$3\frac{1}{8}$	$3\frac{1}{8}$	$4\frac{1}{8}$	7	9
3	9 $\frac{1}{4}$	$1\frac{1}{2}$	$1\frac{1}{8}$	$1\frac{1}{4}$	$2\frac{1}{8}$	$2\frac{1}{8}$	$2\frac{1}{2}$	$2\frac{3}{8}$	$2\frac{3}{8}$	$4\frac{1}{8}$	$3\frac{3}{8}$	$5\frac{1}{8}$	8	10
4	10 $\frac{1}{4}$	$1\frac{3}{4}$	$1\frac{1}{8}$	2	$2\frac{1}{8}$	$2\frac{1}{8}$	$2\frac{3}{8}$	$2\frac{3}{8}$	$3\frac{1}{8}$	$4\frac{1}{8}$	4	$6\frac{1}{4}$	9	11

THE LESSONS OF A LONG TOUR

Mankato, Minn., Aug. 16.—About a year ago I purchased a well-known gasoline carriage. I came to the conclusion that, knowing little, I could not buy too simple a carriage for general use. There are few, I find, at the start that like the gasoline on account of their being a little noisy. With some of my friends this has been the case, but after trying steam and electric they go back and take the gasoline.

I have an 1,800-pound auto about which I knew nothing. About a year ago I took it out of the car, followed directions and she started. I ran it about two weeks, first making short trips. Then I attempted a long one, and had you been with me, Mr. Editor, you could have had a chance to gather information in many ways, as well as spending quite a laughable time. My trip took me into Wisconsin, Illinois, Iowa and Minnesota. We left here at 9 a. m., running to Austin, 120 miles; next run to Cresco, Ia.; then to McGregor, when we took a ferry to Prairie du Chien. Here we encountered hills and roads of all kinds; first sand, then hills that were short and steep, with rock ledges in them. I do not believe that from Prairie du Chien to Mt. Horeb there is one bit of level country. At Mt. Horeb we found a two-seated gasoline carriage of a different make, and found it had been used but a few days and failed to work. I do not blame the auto, as I would not want to travel those roads more than once. We also found that just west of Mt. Horeb a party had shipped a steam carriage, as they could not make progress, the roads being so bad.



We changed our course to the north to Kilbourn, Wis., and traveled about thirty miles to Sauk City. The roads, where there was no sand, were strong and hilly. At Sauk City is a toll bridge and trees hewn on the opposite side from the approach. We ran on the bridge, and when about half across a fleshy German stepped to the middle of the bridge and we made a quick stop. This was a new thing for him and in his broken English he called his wife to come quick, and

between every breath wanted to know what it was. We at last saw his wife looking around the corner of the house, not daring to come nearer, and finally after some talk got him to tell us what the charges were. He seemed to be quite puzzled, as he said he had nothing on the books. We paid the highest price for crossing the bridge—5 cents.



A few miles from Kilbourn a gear broke in the rear axle. This caused us to be hauled into town, where we intended making a short visit. This breakage was not due to any fault of the maker, as the gear had the appearance of being good, but there happened to be a flaw, which could not be seen until broken. We received a new gear from the factory and had it in and were ready to run in three days. This speaks well for the factory.

Our route was due south. We reached Naperville, thirty miles south of Chicago, and intended making you a visit, but, our time being limited, we headed west. We made our first halt at Dixon, Ill., where it rained all night. About 11 a. m. we made a start, on mud roads, west and were caught in the rain and made a short stop at Sterling, where we would have remained for better weather, but we could find no place to run the carriage and could not get anything extra for hotel accommodations, so in a hard rain we started for Morrison, where we found a good, clean hotel, and a fine old gentleman at a livery who took good care of the carriage. The rain continued almost night and day, and we made one more run to Clinton, Ia.

This trip, I must say, equals Mr. Winton's trip in the mud of California. We were in to the axles, where there were low places, but the auto with the assistance of two small boards went out on her own power. I can safely say that I know of no road so bad that this carriage cannot get over it without help. We made a short stay in Clinton to wash off the mud, but the rain still came down. We had our feathers pretty well wet by this time, so concluded to take the rail home, which we did, and

LESSONS OF A LONG TOUR.

have since been glad we did, as there was rain for a week after we left.

We had a slight accident at Clinton, or while going into it. The chain, getting slack, cut a hole through the pipe from the water tank to the engine. This caused little work, as I cut the pipe and put in a short piece of iron pipe with a hose clamp at each end. Since our trip we have used the carriage almost daily, and barring one or two little breaks we have had no trouble. I found a slight trouble in my exhaust valve. As the engine would only turn 400 revolutions I knew something was wrong, and on looking it over carefully found a set screw loose, which let the exhaust turn up, and the cam did not open it until it had compressed a part of the burnt charge. This was quickly righted. I have broken a needle valve a time or two. This will only stop the engine. I carry one with me and put it in in about five minutes.

I had a little difficulty with back firing, and, as a man has to learn, I had a maker of gas engines look it over, and after a day's labor he did not have it right. This was expensive, so, I put on my blue ducks and went to work. I first took out the peep plug so the engine could turn over without compression. I then watched the valve and found that the intake was right, but found that the contact breaker did not break at the proper time on the compression stroke. I set the trip for the igniter over so that it gives a spark on the compression stroke very close to half an inch before the full compression is made. This, of course, holds the intake shut and gives me more power than I had and no back fire.

I have run this auto several thousand miles. Had one puncture in a rear tire, which I repaired, and no leaks. The tires have been pumped up three times. I always keep them hard. I use oil freely, and my expense for oil and gasoline will not run half a cent per mile over our Minnesota roads.

I have, I think, given you quite an insight into the use to which a man in the country will put an auto. On any roads, gravel or mud, my carriage has never failed, and I must say that the maker is to be congratulated on the carriage. I understand the new one, 1901 pattern, has many improvements, but as it is there is certainly no pleasure like riding in a big, heavy Winton.

I trust you will find some of this matter of use to some of the users of gasoline and steam carriages, and that you will fill the columns of your paper with more of the "don't's," as we are all young, and need it.

A. C. B.

Directions for Removing Rust

In the journal of the United States Artillery directions are given for caring for ordnance, and the treatment recommended for rust on polished steel is as follows: Cyanide of potash is most excellent for removing rust and should be made much use of. Instruments of polished steel may be cleaned as follows: First, soak, if possible, in a solution of cyanide of potassium in the proportion of one (1) ounce of cyanide to four (4) ounces of water. Allow this to act until all loose rust is removed and then polish with cyanide soap. The cyanide soap referred to is made as follows: Potassium cyanide, precipitated chalk, white Castile soap. Make a saturated solution of the cyanide and add chalk sufficient to make a creamy paste. Add the soap cut in fine shavings and thoroughly incorporate in a mortar. When the mixture is stiff cease to add soap. It may be well to state that potassium cyanide is a violent poison. For removing rust from iron the following is given: Iron may be quickly and easily cleaned by dipping in or washing with nitric acid, one (1) part; muriatic acid, one (1) part; water, twelve (12) parts. After using wash with clean water.



STANDARDIZATION OF AUTOMOBILE PARTS

BY A MAN IN THE TRADE.

The automobile industry already feels the influence of the few makers who insist on producing parts which are difficult to duplicate, threads which are uncommon, and doing other things in connection with the construction of their vehicles which are likely to cause trouble to owners. It is an old European custom, followed to some extent in this country in other lines of business, but which never fails to react on the people who indulge in it. It causes delay, expense and annoyance, and cannot under any circumstances be considered a stepping stone to the satisfaction of customers.



Years ago people in the cycle industry tried the same thing. Their argument, possibly, seemed plausible at the time. They believed that bicycles, like stoves, should be repaired, or at least the parts supplied, by the makers. If the plan had worked, every cycle maker would soon have built up such a business in parts that the manufacture of new cycles might have been a secondary consideration. But the makers who tried it soon found that they were standing in their own way. There were others who were willing to build machines which the ordinary repair man, with his ordinary facilities, could repair in a few minutes, instead of keeping the owner of the machine waiting a week or more for a part from the factory. Who would buy a machine of complicated design, made up of parts which no man outside of the factory could duplicate, and with hubs and other parts with threads for which it would puzzle a well-equipped machine shop to find a tool? No one. And so the standardization of parts became the proper thing, and every rider found it possible to get his machine fixed at any corner repair shop. There are still people who argue that this same, standardization was injurious to the business. They are unable, however, to produce a sensible argument in support of their theory.



While the automobile is an entirely different creation, and its complicated mech-

anism is a guarantee that its repair will never be undertaken with the same facility, there are many parts, such as nuts, bolts, threads, plugs, steering knuckles, axles, etc., which might be brought to a standard to the satisfaction of the men who own the machines. The small things are the ones which cause trouble. If the vehicle is weak in its small details, it may be considered weak as a whole. The same remark which applies to the chain and its weakest link also applies to the automobile and its parts. If some of them are unnecessarily complicated, the fact will sooner or later—and no later than the time at which makers will be able to deliver machines with reasonable promptness—have an injurious effect on the business of the maker.



It is not expected that in this, the early stage of the industry, makers will take time to get together and discuss matters of this character. The change will be made gradually. It must come, as a matter of course, as the public becomes more familiar with the construction of the automobile, for nothing is of more importance to the purchaser.

The present demand for $\frac{1}{4}$ -inch steam fittings will, sooner or later, take a change for larger diameters, and it might be advisable to look into the future a little and provide accordingly. While the $\frac{1}{4}$ -inch fittings may be entirely satisfactory in some few cases, it is inadequate in others. Should a standard be set for all fittings, the parts now operating successfully with $\frac{1}{4}$ -inch would do quite as well, and would give better satisfaction if enlarged by reason of their working with other fittings of more rational size, thereby making the equipment, as a whole, more efficient.

Consider, for instance, the fittings commonly used in connection with the water glass, regulator and water column. These are usually attached to pipes of the same size, with the result that the water gauge will often show a false water level by reason of a leak somewhere in the upper pipe con-

STANDARDIZATION OF AUTOMOBILE PARTS.

nections, which, by reason of the small diameters, will form a suction and draw the water up when, were there space enough in the tubes and fittings, and were each attached to the boiler separately, there could be no possible chance of such a thing occurring. This has been responsible for numerous burnt boilers.

The same idea is illustrated in the water columns where three cocks are attached to one small pipe. With a hot fire and ordinary steam pressure it is possible to raise the water to the top cock even when the water level is down to or below the third or low cock.



All pipes and connections, as well as the devices used in connection with steam automobile engineering, should be enlarged to properly fulfil all requirements and a standard size set so that designers would be enabled to make their plans accordingly and to allow a larger factor of safety when the machine is placed in the hands of an unskilled driver. This latter feature alone is sufficient reason for making the change, for after all it is the unskilled operator who makes automobile building either success or failure.



While standardization can be applied to the steam vehicle with advantage, the gasoline needs consideration also, but not to the same extent. The plugs, which ordinarily give considerable trouble, and which often must be changed either for the reason that the owner would like to try a new kind or larger size, are at present a great source of trouble. One maker will use a French thread, which, if it becomes necessary to refit in some place away from the factory, necessitates delay, while another will use one which, while a standard thread, is of such size that not one shop in 20 will have the necessary tool to duplicate it. This statement is borne out by the fact that when a tap was needed recently, one of the largest machine shop supply houses in Chicago had but one in the house suitable for cutting the thread used, and that was found after a hunt of at least half an hour. The clerk stated he had never before been called upon

for such a size, and doubted at first whether it could be obtained without sending to the factory.

That sort of thing does not keep the user in a pleasant frame of mind and would be better entirely eliminated. The one feature of automobiling which will make the self-propelled vehicle popular will be the ease with which necessary repairs can be made in any part of the country, and it certainly behooves the makers to take this into consideration.

Some makers reply that they do not want their machines to be handled or repaired by unskilled mechanics. That argument is weak, for, while the country repairman is not an unmixed blessing, the brains and skill scattered throughout the country must be gradually prepared to provide for accidents, and this will be more easily accomplished by placing the facilities within as easy reach as possible.

No More Burned Fingers

The C. T. Ham Co., Rochester, N. Y., is marketing an automobile lamp. It is called the Cold Blast tubular driving lamp, and is fastened on the side of the dash. One of its features is that it has a handle for



carrying it around. It can be detached and used as a lantern at a moment's notice. Those who have had to go under the automobile in the dark and crawl around the machine to find some ailment will appreciate the portable feature.

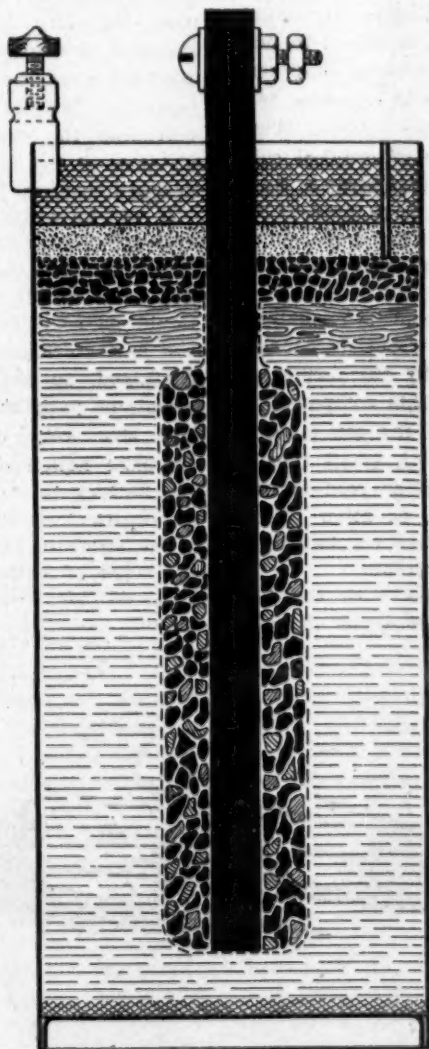
HOW DRY BATTERIES ARE MADE

The introduction of the motor vehicle has called for the use of a compact and light form of battery for ignition purposes, and in consequence the dry battery has added this new industry to its previously wide field of usefulness. And yet how few people know anything about its interior construction?

The writer lately came in contact with a gentleman who is an agent for a new battery. During a short conversation the gentleman extolled the virtues of his device, but when asked whether he knew what was inside of it was reluctantly compelled to answer in the negative. A brief description of construction of the type of battery most commonly used may therefore prove instructive.

The accompanying illustration shows a cross-sectional view through the center and the interior construction. The outer casing, which forms the negative element of the cell, is of sheet zinc of suitable gauze, made in rectangular or round form, as desired. The carbon, which forms the positive element of the cell, is shown in the center. It is

surrounded by a bag or sack similar in every way to a small tobacco sack and of the same material. In this bag and around the carbon element is a mixture of black oxide of manganese and crushed coke, in the proportion, by weight, of about 70 per cent manganese and 30 per cent coke, which makes about an equal bulk of each.



Manganese alone should properly be used, as it is a far better depolarizing agent than coke. But the writer regrets that he knows of only one or two forms of dry batteries in which this is used. The close competition between manufacturers seems to have compelled them to use such mixtures to cheapen the first cost.

Around the outside of the sack containing the depolarizing medium, is usually a mixture in the form of a jelly, containing salammoniac in solution as the active agent and a small percentage of chloride of zinc or glycerine to prevent the jelly from becoming dry or hard. The salammoniac causes an electro-chemical action to take place when the circuit is closed.

IMPORTANT BATTERY DEVELOPMENT

outside of the cell, thereby producing an electric current.

Sometimes bi-sulphide of mercury is added. It amalgamates the interior surface of the zinc and thereby not only prevents the salts from crystallizing on them, but increases the voltage of the cell slightly. Many different compounds are used as a base for the active agency in dry batteries, but the general construction and principle is as shown and described herewith.

In the bottom of the cell a thin layer of insulating material is generally placed, to prevent electro chemical action taking place there.

After the carbon element, with its bag of depolarizing material, thoroughly moistened with water, is placed in position in the active material or jelly compound, a layer of excelsior or coarse sawdust is placed upon the surface. Upon this is placed a layer of crushed coke, and on top of this another layer of finely powdered coke. This is to prevent the sealing compound, which goes on top of all, from percolating through to the jelly, while melted.

The sealing compound is usually a mixture of pitch and rosin or asphaltum and rosin, generally the former, as it is the cheaper. This compound is melted and poured on the top layer of finely powdered coke. A small tube or pipe of paper, bamboo or reed is usually added, as shown, to allow of the escape of the gases when the battery is in action on a closed circuit.

Some makers dispense with the jelly as a base for the active agent and sub-

stitute coarse sawdust, paper-wool, a material used as a substitute for wool or cotton batting, or other material, and simply moisten it with a salammoniac solution. This is a poor substitute for the jelly compound and quickly dries out, this being the principal reason so many dry batteries give out after being only a short time in use.

One binding post for making the electrical connection outside the battery is shown on top of the carbon element, and the other is soldered on to the side of the zinc cell, as shown.

The upper portion of the carbon is usually dipped into melted paraffine, before putting in place in the cell, to prevent the salts in the compound from creeping or working up through it to the connection on the outer end of the carbon, by osmotic action, and thereby corroding the same, increasing the resistance of the cell and eventually rendering it useless.

It will be readily seen from this brief description that it is a dry battery only in name. If it were to get dry it would not work at all. There must be some liquid or semi-liquid medium in which the salts forming the active agent are contained, so as to make an internal circuit or path between the carbon and the zinc cell, otherwise no electrochemical action could take place when the battery is short-circuited, or put in an electrical circuit to do work.

The electro-motive force or voltage of this type of battery ranges from 1.2 to 1.45, and from 5 to 8 amperes on a short circuit.





CYCLE SPORT AND TRADE



One day last week the New York Telegraph contained a column of matter relative to the A. B. C. in which it was intimated that a row is brewing between the Pope and Coleman interests and that Colonel Pope may become president of the concern at its next annual meeting, which occurs in October. The reasons given are personal animosity between the two and the fact that the combine has made no money and does not seem likely so to do for a long time.

Reference is made in the article to a set-to which once occurred between Pope and Coleman, and which was told at the time as a state secret, but has never, so far as we remember, been published. Eight years ago Colonel Pope, whose holdings were then confined to the Columbia factory, aspired to own the Western Wheel Works. He had not then started the Hartford company, and wanted a factory in which cheap and medium grade goods might be made. The Colemans, R. L. and Tom, were then the eastern representatives of the W. W. W. They cut more figure in the affairs of the concern than their official title conveyed, but had not aspired to the ownership, or even any part of it.



Louis Shoeninger, manager and practically the owner, a prince among good fellows, had gone to Europe on account of ill-health. It was almost certain at that time that, even though he might recover to a certain extent, he would never be able to attend to business. His father, who, by the way, died lately, leaving but little of his once handsome fortune, was determined that his son should never again take up the cares of business, and was therefore willing to sell. And so Arthur Pattison, then secretary of the Pope company, was sent out to open negotiations.

All went well until one day R. L. Coleman came out from New York, and was

told by Mr. Shoeninger that "a fellow named Pat" had been there and that he might buy the factory for the Pope company. Tom Coleman left for Europe by the next steamer to secure from Louis the control of the plant.

After he had gone R. L. Coleman and Colonel Pope met and the proposed transfer was talked of. It is said that the colonel kindly promised Coleman that he should be looked after in proper style and that Coleman expressed himself as duly thankful. Within a few days of this conversation Tom Coleman sailed for home with the control in his pocket. Whether this incident was the first and only cause of feeling between Coleman and the colonel is unknown, but the incident had the effect of creating a breach which has never been thoroughly bridged.



But to return to the story that the colonel is to be president. That, of course, is quite among the possibilities if he wants the position, which, however, may be doubted. The reason given for the change is not sufficient and the colonel has nothing to gain by accepting the responsibility. No living man could have made money for the A. B. C. under existing conditions. When Coleman accepted the position he did so with the full knowledge that he had undertaken a thankless task and that to make money would be impossible for a long time. It was Coleman who resisted to the last the ridiculous proposal to capitalize the concern for \$80,000,000, and to whom, to a very great extent, the success of the floatation, such as it was, was due. He has been unmercifully businesslike in all his dealings since that time, sparing neither friend nor foe. He had ridden rough-shod, when he thought it necessary, over the ideas of men who were in a position to hurt him later on and has shown a never-ceasing determination to car-

CYCLE SPORT AND TRADE

ry out the plans originally made, sink or swim.



That all of the people connected with the concern will agree with him, or have agreed with him, in all that he has done is not to be expected. As to outsiders, few agree with him. Their interests lie with the downfall of any and everyone responsible for the present policy of the company toward outsiders. Coleman may be deposed, but it may be accepted as certain that his successor will do no better, so far as the financial condition of the company is concerned. It isn't within the bounds of possibility. The time may come when the capitalization may be reduced, expenses trimmed still lower and when business may improve. But in the present state of the industry, the company's capitalization and other matters which hamper the movements of its officers and directors, the genius of a Morgan could do little or nothing to place the A. B. C. on a money making basis.

Coleman is doing all that can be expected. Pride in the cycle trade has been sunk. The company makes all sorts of things from automobiles down to hair curlers. Indeed, the world would be surprised could it be apprized of some of the undertakings into which the company has entered. There may be money enough in hairpins and mouse-traps to pay a dividend on forty millions some day, but the man doesn't live who can do it at present.



As to Colonel Pope's personal desires, every man who knows him at this stage of his career realizes that he is too big a man to allow differences of the past and of a personal character to stand in the way of business or to inspire him to seek a position which means nothing in prestige and little, to him, in wealth. Should any change occur in the presidency of the company the incidents which lead up to it will be of greater weight than those mentioned in the report referred to.

CYCLE REPAIRERS AND AUTOMOBILES

While it would be a too broad assertion to claim that every cycle repairer is now able or will be able to attend to the repairs required by touring automobilists, it is reasonable to assume that men of that class are logically the repairmen of the future. It therefore behooves them to pay attention, in this early stage of the industry, to the requirements, even though all the repairs may not, for the present, be brought to them to perform.

Reference has already been made in these columns to the necessity of care on the part of automobile owners in the selection of repairers and to the fact that shingles are going up all over the country which inform passers-by that tinkers, blacksmiths and other expert mechanics, with as varied and as valuable experience, will undertake the most complicated repairs. For a time people will be taken in by impostors who aim to make a fee and gather a little experience. But that class of repairman will not last, and in the end the man who has acquired a fair knowledge of the subject will be able to secure a good return for his trouble. For, be it remembered, the repair of an auto-

mobile is an altogether different thing to the repair of a bicycle. In late years the latter has become so common and so simple that a score of men are to be found in every crossroads town ready to undertake anything required. With the new vehicle the repairs will be more difficult, will require more brains, better tools, or rather more tools, and a general knowledge of the various powers by which they are propelled, and which will not be easily gathered by any except those who make a careful study of the matter.

If one has had a few years' experience in general machine work, and is conversant with gas and steam engine practices, he may safely take up motor work with a fair measure of success. It largely depends upon a repairer's ability to diagnose a case and effect a repair how much business comes to him. To diagnose a case it is of vital importance to understand the principles upon which the particular motor in hand works. But the motor is not the only thing which must be studied. Various vehicles have various methods of conveying the power from the motor to the road wheels, and the va-

CYCLE SPORT AND TRADE

rious systems employed by the leading makers should be thoroughly understood. At the present time there are two or three main systems of transmission in use, and the makers use adaptations of these systems in their own particular carriages.

Almost the most important thing of all is a thorough knowledge of electric ignition. A superficial knowledge is certain to lead one into difficulties. Books on the construction and use of batteries and accumulators, and the properties of the induction coil, are to be had at a low cost, and these should be carefully read and understood. The coils in use on some motors may differ slightly from those which are described in the textbooks. Information of great value has also appeared from time to time in this paper.

There are other items that require constant study. Such items include carbureters, water-circulating pump, and other smaller details, which, in the march of improvements, are constantly being changed.

A suitable workshop that can be entered from a roadway is most desirable. A man does not like his carriage left out in the street while being attended to. If the carriage can be brought into the repair shop it is far more convenient and economical for the carrying out of the repair. An inspection pit is convenient. Some few cycle repair men may possess many of the tools necessary. Few have all of them, however, another reason why the tinker-repairer will be unable to work into the business. A good lathe for facing, screw-cutting, turning, and capable of boring at least a 1-inch hole, is a necessity. A milling attachment often brings one easily out of an otherwise difficult job. A good set of pipe tongs is a valuable addition to the small tools. The shop should have a drill press, a grinder, brazing and vulcanizing outfits. If the machinery be driven by a gas engine the user may obtain a lot of good experience therefrom, but the most practical way of acquiring knowledge is to invest in a motor cycle of some description, not necessarily a new one. This will prove a good educator and will be a practical advertisement for the owner.

A Grand Independent Plant

Some idea of the magnitude of the business of the National Sewing Machine Co., which makes sewing machines and bicycles

at Belvidere, Ill., may be gleaned from the fact that during the last ten months its profits have been \$180,000, or 50 per cent of its capitalization. It spent \$100,000 in additions to the factory, has a surplus of \$871,311, spent \$605,000 for labor in the past 10 months and sold machines to the value of \$1,500,000. The plant is worth \$1,754,000.

It is of interest to the trade, in view of these facts, to note that the company will be in the cycle trade next season as vigorously as ever. Its officers are not prepared, at the moment, to make any detailed statement beyond the fact that its line will be complete and up-to-date in all its details. L. W. Conkling, who continues at the head of the cycle department, is pleased with the concern's record in the matter of guarantees. "Never in our experience," he says, "has there been so little complaint regarding our goods. In fact our guarantee account this year is something that is hardly worth mentioning and we find our dealers have taken note of the fact of the phenomenally good satisfaction our goods are giving, and we reason from this that we are in line for a good trade next year or at least for a good big share of whatever trade there may be. We anticipate now that we shall be prepared to make shipments in quantities of 1902 models not later than Oct. 1."

Cycle Market in Turkey

Writing from Harput, Turkey, Thomas H. Norton, United States Consul there, says:

"The pioneer bicycle, which I brought with me at the time of establishing this consulate six months ago, has attracted general attention and interest. Many have been prompt to recognize the exceptional adaptation of the extensive Harput plain, with its comparatively level and well-kept roads, to the use of the bicycle. Personally, I have found the wheeling excellent, even among the hills, over the narrow bridle paths. At least a score of gentlemen, including the vice-governor general and other officials, have expressed the wish to secure wheels from the United States. In order to meet the demand, at my suggestion an agency for American bicycles has been established here, and an order sent to the United States. The agent, S. G. Varta-

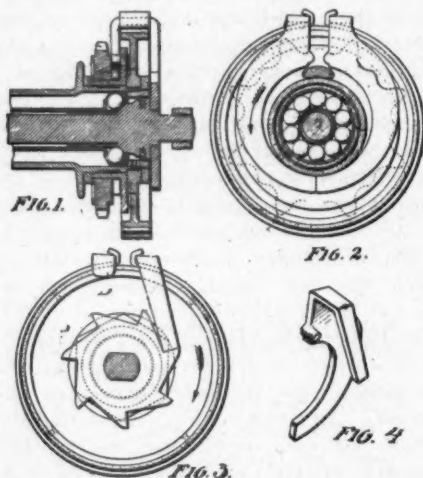
CYCLE SPORT AND TRADE

bedian, was formerly employed in the Colt works at Hartford, is a skillful mechanic, has a good equipment of American tools, and can satisfactorily handle the ordinary repairs. Being familiar with English, Turkish and Armenian, he is exceptionally well qualified to represent this branch of American manufacture in what is virgin territory. Bicycle firms desiring to enter this field can address correspondence directly to this consulate (postoffice address, Mezreh, Mamouret-ul-Aziz, Turkey in Asia). Posters and illustrative matter can advantageously be sent with preliminary letters. The types of wheel which will find ready sale here should be simple in style, provided with brakes, and as low-priced as is consistent with durability and the use of first-class materials. The climate is hard on caoutchouc, and in the choice of tires it is necessary to bear in mind the frequency of stones on all oriental highways. It is desirable to study methods of packing frame and wheels so as to insure the maximum of economy in cubic space for the long ocean journey to Samsoun, the nearest port on the Black sea, as well as low weight for the two or three weeks' trip over the mountains to this city. The packing should be such as to effectually prevent any damage from the continuous jolting and rubbing during this overland journey. Anatolian female garb and riding customs are such that the diamond frame will probably meet all demands made for some time on the agency."

The Latest Coaster Brake

George S. Green, of Philadelphia, is the inventor of a coaster brake whose distinctive feature lies in the method of application. The barrel of the hub is provided with a flange, screwed to its outer end and held thereon in a manner similar to that of applying the ordinary sprocket-wheel. This flange is, in fact, the driving member of the hub and is also the seat of the brake-band. Directly inside of it is another, rotatable upon the hub. This sleeve serves as a bearing for the sprocket-wheel, which is provided with a small lug projecting outwardly to engage the lever for applying the brake-band and driving-clutch. In the illustrations, Fig. 1 is a fragmentary sectional view, showing the driving end of the hub. Fig. 2 is a sectional view taken on

a line of the bearings and showing the inner side of the levers for applying the brake and the lug attached to the sprocket-wheel for the purpose of operating these levers. Figure 3 is a sectional view taken from the outer end of the hub and showing the ratchet arrangement rigidly attached to the axle, which is held in non-rotatable position in the frame and serves to hold the stationary end of the brake-band during its application. Figure 4 is a perspective view of the clamp-lever, the two sides of which are shown in Figs. 2 and 3 respectively. This lever is fulcrumed by



means of the lug shown in Fig. 4, in the flange sleeve on which is seated the sprocket-wheel. In all the illustrations the device is shown as being in a coasting position.

The parts, being in coasting position, and it being desired to rotate the hub by the action of the driving-sprocket in the direction of the arrow shown in Fig. 2, the initial movement of the sprocket-wheel in the direction indicated serves to wedge the lug thereon between the sleeve, upon which it is seated, and the inner extremity of the lever on the side of the arrow, thereby swinging it outwardly. Said outward movement of the lever serves to disengage its pawl extremity, shown in Fig. 3, from the ratchet attached to the stationary axle and simultaneously clamp the clutch-band upon the periphery of the flange upon which it is seated, so that by further rotation of the driving-sprocket the hub is positively

CYCLE SPORT AND TRADE.

driven in the desired direction. The clutch-band, both of the levers shown in Fig. 2, and the sleeve upon which they are fulcrumed are, of course, rotated therewith.

The clamping of the parts is effected by approximately one-quarter revolution of the driving-sprocket and the parts may be restored to the idle position shown in the illustrations by reverse rotation of the driving-sprocket to the same extent, which reverse rotation not only brings the attached lug to the intermediate position shown in Fig. 2, but also restores the pawl of the clutch lever to engagement with the non-rotatable ratchet upon the axle. Further reverse rotation wedges the aforementioned lug between the sleeve upon which the sprocket-wheel rides and the inner extremity of the opposite clamp-lever, thereby contracting the clutch-band upon the periphery of the flange upon which it is seated and acting as a brake.

It will be readily understood that in accordance with the extent to the traverse of the lug in contact with the lever upon which it now acts the rotation of the hub may be slightly retarded or prevented to the maximum degree. The pawl of the opposite lever resting upon the ratchet stationary axle renders the band a fixture with respect to the frame work of the bicycle during the braking operation of the device. In order to insure the instantaneous disengagement of the brake and clutch-band from the flange, it is assumed that this band shall be made of an elastic material, thus assisting in releasing it as soon as pressure is removed from the lever holding it in position.

Racing at L. A. W. Meet

The second week of cycle racing and the annual meet of the L. A. W. occurred at Buffalo last week. On Monday the sensations began with the trials for records. Henshaw and Hedstrom of Springfield attacked the world's 1 mile motor-tandem record, and succeeded in clipping 14.5 seconds, covering the distance in 1:18.2-5. G. W. Butler of Buffalo lowered the motor-bicycle record 7:16.2-5 to 6:18 for five miles.

Joe Fulton of Springfield, Mass., succeeded in lowering the records for two and three miles established by Walter Smith, the four miles established by Dalke, and the

five miles made by Nelson at Vailsburg on Saturday. He covered the distance in 8:02.1-5. Fulton's glory was short lived, however, for Walter Smith came out half an hour later and again established new marks for the four and five miles, his time being 6:17 and 7:53 respectively.

On Tuesday Lawson beat Taylor in the final of the quarter by a brilliant trick. Taylor held the rail and forced Lawson to take the lead. They went to the eighth at a snail's pace. Lawson began to let out as they rounded the lower turn, with Taylor on his rear wheel. The Buffalo boy made a feint at running up on the bank for the finish, and the major tried to steal through on the inside. Quick as a flash Lawson got back to his position of vantage, and was away. The sudden change confused Taylor and he lost. Lawson won by two lengths.

Henshaw and Hedstrom won the 10-mile tandem race in 13:22, beating record by 1:28, and in a 5-mile motor bicycle record trial Holley did in 7:10.1-5.

Only one final was run Wednesday. Dalke beat Smith in a 15-mile paced race in 25:21.2-5. There was hard racing in preliminary heats and again the determination of the alleged white men to down the colored one at all hazards was shown. They succeeded. Thursday they ran off the final of the 2:10 class, which Bowler won in 2:44.2-5. Kramer won the one mile Pan-American circuit championship from Lawson. Bowler was disqualified for fouling Taylor in the final of the half-mile handicap, and the latter was given second position to Lester Wilson, 15 yards. The event of the day was the one-hour paced race between Elkes and Edouard Taylore. The former covered 38 miles 1,690 yards in the time and lowered record from the second to the nineteenth mile.

On Friday Major Taylor won both of his heats in fighting finishes. The colored rider was forced to work his way out of some tight pockets in the ten-mile championship, and won the plaudits of the 10,000 spectators when he landed the heat in a hot finish, with Fenn of Bristol second and Tom Cooper third, wheels apart. The final took place Saturday. Iver Lawson won. The sprint for home was started with a lap to go, with Kramer, Lawson and Taylor leading the bunch. Turning into the straight Kramer had a slight lead, followed by Taylor and Lawson on the outside. Lawson came at a

CYCLE SPORT AND TRADE.

terrific pace. A blanket would have covered the three.

The last race of the meet was the one-mile handicap professional. The long markers in the race set out a fast clip, too fast for the scratch men, as Kramer was the only man to get within hailing distance of the field in front. Newhouse took the lead on the last lap and was never headed. The attendance throughout the week was extremely large.

Monday at Madison Square

New York, Aug. 19.—Six thousand people thronged Madison Square Garden to-night. Trial heats were run off in the afternoon.

Collett, Kimble, Taylor and Fisher were the starters in the first of the first semi-finals of the circuit championship. In the second lap on the first turn Fisher was in the lead, followed by Taylor, with Kimble up the bank sprinting for the lead. Taylor tried to go through and he and Kimble collided and fell down on Fisher. Collett escaped and finished and later Fisher mounted again and went the distance. It was no one's fault in particular and the referee let the heat stand as they finished.

Fenn, Lawson, Kramer and Freeman rode in the second heat. Lawson foolishly gave the others the lead and as he tried to go around the others began to spread out and sprint, also forcing him to the rear again. Kramer won, with Freeman second.

In the grand semi-finals Collett beat Fisher and Kramer outpaced Freeman. Kramer beat Collett a length in the final.

Michael gave a beautiful exhibition of pace following in the match with McFarland and renewed his popularity by winning by 8 laps in 26:21 2-5. Michael beat all the indoor records up to and including 8 miles.

The 2:10 mile fell to Jack Coburn in 2:11 4-5, with Newkirk second and Leander third.

Elkes Gives Way to Walthour

New York, Aug. 17.—Walthour won a decisive victory at Manhattan Beach this afternoon over Harry Elkes in the first of the series of three motor paced races, which Brady has arranged between these two riders and Will Stinson. The conditions were that today's winner was to race Stinson next Saturday and on the following Sat-

urday the trio should meet. The defeat of Elkes by Walthour in the big race several weeks ago is still fresh in motor racing history. Elkes, however, gave his admirers great hope that he would retrieve his defeat by his ride at Buffalo, in which he broke all competition records from 2 to 19 miles.

It was far from a record-breaking afternoon at the Beach, the sea breeze being strong. The race was an hour. The start was a flying one, Elkes getting the better of it. Walthour, however, at once went to the front and led the first lap by a length, which he increased to three lengths at the mile. Elkes went up into his old place at the front in the second mile. Walthour was playing a waiting game. He made several bluffs to pass and there was side by side racing for a lap. He would then drop behind some 20 or 30 yards. The supreme effort of the Southerner came in the 20th mile. The struggle was short and decisive. Just as the mile was completed Walthour shoved a yard ahead. Walthour led by 100 yards at the close of the 21st mile, by one-third of a lap the 23d and by half a lap the 24th.

The southerner gradually overhauled his man and in the 26th mile had lapped him for an instant. Elkes, however, came again and wiped out the lapping. When Walthour made his final spurt he rushed to the front with terrific speed and won by 750 yards, covering 36 miles 2½ laps in the hour.

"Unser Willy's" Popularity

After the Great Prize of Paris the Hanover "fat purse" is the oldest in Europe. It was run for the first time in '97, by the Hanoverschen Anzeiger, a daily paper, which opened a public subscription for prizes and received more than it wanted. The race was won by Bourillon, from Barden, Arend, Lehr and Huber. The first prize amounted to \$750. In '98 the prize was reduced to \$625, and was won by Buchner, from Van den Born. In '99 the city gave a subsidy of 1,500 marks, but the first prize was again reduced, this time to \$500. Huber won, followed by Domain, Buchner, Van den Born and Heering. In 1900 the city again gave 1,500 marks, but other subscriptions did not amount to much, and the first prize fell to \$375, won by Huber, followed by Arend, Grogna, Mayer and Schilling. This year the city only allowed 500

CYCLE SPORT AND TRADE

marks and the first prize was only \$200. The event took place on Aug. 4. The final was the finest seen in the German city. The four semi-finals were won by Ferrari, Huber, Arend and Van den Born, and the consolation by Mayer. These lined up in the final. Each tried to take the lead, and the final effort begun almost a lap before the bell. Soon after Van den Born started for the front from fourth position. Arend went after him and caught him when entering the home stretch. The Belgian, however, won by half a length. Arend, who is one of the most sportsmanlike of riders, congratulated the victor, and this pleased the crowd to such an extent that they tried to carry him around the track, yelling "Unser Willy" (Our Willy).

Standing of the Men

New York, Aug. 19.—Frank Kramer by his victory at Madison Square Garden tonight reached the half century mark in the championship table. Lawson's successes at Buffalo netted him the greatest gain of the others, jumping 10 points. Taylor still holds second place, but five points ahead of Lawson. These three seem to have the championship battle to themselves, with Cooper, Fisher, Fenn and Wilson as the runners up. The score up to the close of tonight's racing is: Kramer, 50; Taylor, 27; Lawson, 22; Cooper and Fisher, 14 each; Fenn, 13; Wilson, 10; Collett and Freeman, 6 each; Gascoyne and McFarland, 5 each; Kimble, 4; and Hausman, Butler and Newhouse, 1 each.

An Unprecedented Performance

At the amateur meeting given at the Paris municipal track Aug. 4, Piard, who had previously done little, won every heat and final in which he took part. He won his heat from scratch in the 900 meters handicap and the final by half a length. He won his heat in the "trade" race and the final by a length from six starters. He won the heat and semi-final in the 2,000 meter scratch race with a tandem setting the pace, and in the final he ran away at the last turn, winning by four lengths. In the challenge club race he won first place, and this made him club the winner. With Simon as team mate he won his heat in the tandem race and in the final, which was the hardest of the day's events, he

again passed the tape a winner by a few inches. Piard thus won 10 events the same day. This is a record.

For Prizes of \$24,000

New York, Aug. 19.—A great series of races to determine the paced championship is in process of organization by the management of Manhattan Beach, Charles Run Park and Providence Coliseum, and Howe, the manager of Waltham. It is proposed to have seven starters in each—Elkes, Waltham, Stinson, Michael, and Nelson for sure, and the other two to be chosen from Moran, McFarland, McEachern and Champion. It is said that there will be six races and the purses will aggregate \$24,000. The number of races and the distribution of the gate money will be determined later. The purse or gate money is to be divided at the close on the bases of six, five, four, three, two, one points in each race, with probably about 30 per cent going to the winner.

In Reminiscent Mood

L. H. Campbell, of Providence, now connected with the Eastern Automobile & Supply Co., is proud of a record he established years ago. He arranged the first bicycle race meet at which the safety bicycle was seen. It was in 1888, and Campbell and his brother got up the meet with the assistance of subscriptions from the merchants. Among the racers was old war-horse William Van Wagoner, now of the Century Motor Vehicle Co., who was riding one of the early Eagle bicycles, which had the small wheel in front; Clarence E. Monroe, now of the Frank Mossberg Co., was also in the race. The winner was B. Taylor Bruce, of Providence, who rode a Victor, of the Rover type. The reporter for the Providence Journal stated in his account that the ladies felt sorry for the rider of the little machine, as it surely looked as if it had no show against the six big ones—four ordinaries and two Stars, the latter similar in shape to the Eagle but lever driven. But the little machine, to the surprise of all, distanced the field and won in 3:02 1-3, the time, by the way, being a novelty. Charlie Weld, since well known in the manufacturing line, was second in 3:05.

The Campbells have always been prominent in Providence cycling, and the riding

CYCLE SPORT AND TRADE

of Mr. Campbell, on a Star bicycle, down the City Hall steps of that city created a sensation, which was followed by Rex Smith riding down the Capitol steps at Washington. There was a lot of rivalry in Providence in those days among the bicycle agents. Whitten & Co., the head of which was the well known Charles Whitten, who is still in business, were considerable factors in the bicycle parts business at the time. They came out with an advertisement, in May, 1888, which read as follows:

"Whitten & Co. are not sole agents for the wonderful curb-stone, city-hall steps, college and Bunker Hill monument S-T-A-R-S, but we always have a full line in stock, taken in exchange for our other wheels, and are always glad to sell at most any price, so that riders of 'curb-stones' and 'obstructions over a foot high' should visit us if they are looking for a bargain or send for list to 218 South Main street."

Of course this was a slap at the Campbell Cycle Co., agent for the Star, which at that time threatened to become popular, but the H. B. Smith Co., which made it, failed to take the tide at its flood.

Lamp Ordinance Needed

The need of bicycle lamp ordinances was never better illustrated than it is today in Buffalo. Many accidents occur daily simply because riders are speeding around the city in the dark and come into contact with pedestrians and carriages, besides running into obstacles and holes. It is thought that a state law will be enacted at the next assembly. Many accidents have occurred on cycle paths throughout the state and recently a Rochester rider was killed through running into another on a narrow path. There is no excuse now for a rider to be lampless, as the price is within reach of everybody. The trade should see to it that lamp laws are passed in every city.

Auto-Bi Records at Buffalo

As a fitting climax to the two weeks' bicycle and motorcycle racing held at the Pan-American the Auto-Bi, made by the E. R. Thomas Motor Co., broke the world's records for one and five miles. The old records were, one mile, 1:23 1-5, and five miles, 7:10 4-5. The new records are

1:22 1-5 and 7:05 4-5 respectively. When records are at such figures it is generally regarded as noteworthy to knock off fractions of a second, but it will be noted that in this case several seconds were taken off. The old records were held by a motor weighing nearly three times as much and having twice the rated horsepower of the motor that established the new ones. The Auto-Bi used was a regular road machine with the muffler taken off and having a larger driving pulley. This same machine had previously been ridden by thousands of Pan-American visitors, being one used, in connection with the Thomas exhibit, to give visitors free rides on the flat track in the Stadium. When the board track was put in this machine was sent to the factory, where it was used by the sales department to give rides to visiting dealers.

Gustav Hegmann, one of the prominent and successful bicycle dealers of Santa Rosa, Cal., died suddenly on Sunday, Aug. 11, from the effects of an operation for appendicitis. Leavitt & Bill, of San Francisco, who are thoroughly posted concerning the California trade, write that the widow of Mr. Hegmann is desirous of selling out the business and good-will and add that this would be an excellent opportunity for some person desirous of entering the bicycle business in one of the nicest towns in California.

If the statement that all the time at Madison Square Garden has been filled from the first week in November to the last of April is true there will be no cycle show there next spring. No dates have been booked for such an event so far. From opinions expressed last season it may be gathered that the management has no thought of any future cycle shows.

The bicycle business formerly conducted by the Arcade File Works, at Anderson, Ind., is now owned by the Allerton-Clarke Co., of New York, which company was formerly the owner of the file works. The latter, however, has changed hands and is now owned by the Nicholson File Co., of which J. W. McNevin, so long connected with the old concern, retains the resident managership.

The Consolidated Rubber Tire Co. has acquired control of the Hall sectional tire.

LATE EFFORTS OF THE DESIGNERS.

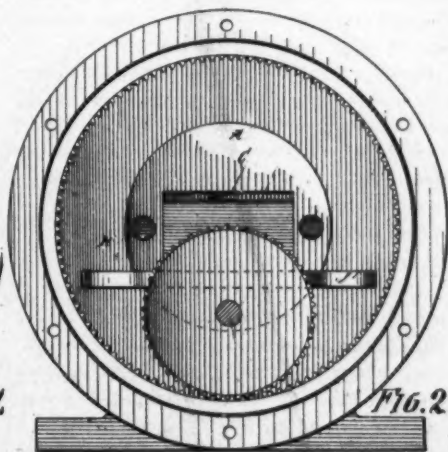
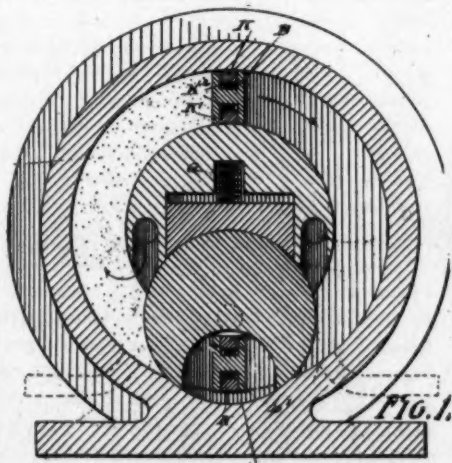
A rotary engine differing radically from any on the market, has been designed by F. S. Pickering, of Olathe, Ks. A unique feature is the form of the abutment. This is shown sectionally in Fig. 1, in a position surrounding one of the piston heads. Fig. 2 is a sectional elevation with one of the cylinder heads removed, and showing, particularly, the means whereby the abutment, which is integral with the power-shaft, is rotated. The internal gear is located on a ring, on the inner side of which are the piston-heads. As the piston-heads rotate this ring is carried with them and the internal gear, acting on the spur-gear attached to the power-shaft, revolves it and the abutment. Concentric with the cylinder is an internal member, shown sectionally in Fig. 1, and in elevation in Fig. 2. The steam is admitted through ports in this member and passes into the cylinders as shown in the arrow in Fig. 1, thus acting upon the piston-head and forcing it in the direction indicated by the upper arrow. The rotary motion of the abutment and its sectional form is such as to always keep the steam chamber closed at this point, but at the same time allow the pistons to pass in their travel through the semi-circular opening in the abutment.

To absolutely prevent the escape of steam around this abutment the central core is provided with a movable packing in con-

tact with the peripheral surface of the revolvable abutment. Suitable springs are provided, which in conjunction with the balance pressure of steam, press the packing in contact with the abutment, and in turn press the opposite side of the abutment against its seat in the recess in the inner surface of the cylinder. Suitable packing boxes are, of course, provided to prevent the escape of steam around the power-shaft, where it passes through the cylinder ends. The ring, containing the internal gear, into which the ends of the pistons are attached, is also properly packed.

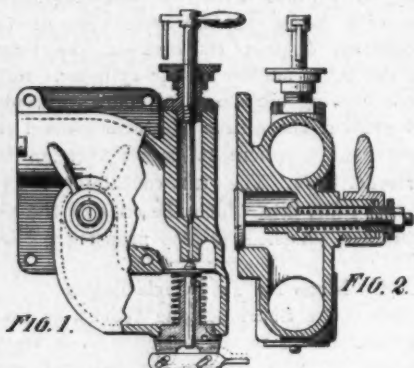
Mixer for Two-Cycle Engine

The Lake Shore Engine Works, of Marquette, Mich., is the assignee of a recent patent on a vaporizer for internal combustion engines, two views of which are shown. It is for the two-cycle type of engine and is to be attached directly to the side of the crank-casing, in which a hole is drilled for the inlet of the vapor, thus doing away with a feed-pipe. In general effect it differs little from several other vaporizers or mixers. The flow of the gasoline is regulated by a needle-valve. Directly beneath the inlet is a downwardly moving auxiliary suction valve, provided at its upper end with a conical portion normally seated within the oil inlet, whereby the latter is controlled. This valve is also



LATE EFFORTS OF DESIGNERS.

provided immediately below the conical portion with a cylindrical disc fitted within a cylindrical seat, formed at the lower end of the elbow section, so as to freely slide therein to permit the conical portion to snugly fit within its seat at the oil inlet, and so also as to entirely obstruct the charge-inlet passage. The stem of the valve extends through a guide, threaded into the



body of the vaporizer, and projects exteriorly to a slight extent. A coil spring serves to hold the auxiliary valve on its seat.

When a vacuum is developed within the crank-chamber or, if the vaporizer is applied to a four-cycle engine, within the cylinder, the main valve, shown in Fig. 2, and the auxiliary valve open and a supply of oil impinges against and flows over the disc of the auxiliary valve. At the same time a charge of air is drawn through the downwardly extending elbow section, shown partly in Fig. 1 and mixes with the liquid as it flows over the disc carrying it along through the upwardly extending elbow into the engine by way of the main valve.

In order to conveniently regulate the suction developed within the vaporizer, means are provided for regulating the extent of opening of the main suction valve. The stem passes through a suitable guiding sleeve cast in the body of the vaporizer, which is recessed to form an annular chamber about the valve stem, as shown in Fig. 2. The outer end of the valve stem is guided within this chamber by means of flange guide and stop-nut, adjustably threaded upon the valve stem and held in place by a lock-nut. Contained within the chamber thus formed around the valve stem is a helical spring, one end of which is seated

upon the inner end of the chamber, while the other bears against the guide-nut, thus tending to hold the valve seated. Upon the end of the guide sleeve cast upon the body of the vaporizer is mounted a rotatably adjusted nut, provided with an inwardly turned flange for engaging the flange of the stop-nut on the valve-stem. This nut is provided with a suitable handle and a diagonal slot within which projects a pin fastened into the guide-sleeve. By adjusting the position of this nut the opening of the valve may be regulated.

The throw of the auxiliary valve is regulated by a sliding piece located directly beneath its stem as shown in Fig. 1, and which, as it is shifted, moves to or from the end of the valve-stem. It will be seen that these adjusting members may be operated by short handles attached thereto, or may be connected by any suitable means to levers located at the convenience of the maker.

A Gas Engine Starter

Jacob P. Wright, of New Haven, Conn., and Jas. N. Wright, of Newark, N. J., have patented a starting device for oil or gasoline engines. In common with many others its power is stored in a convolute spring, wound up while the engine is in motion. The designers have provided a cylindrical casing, having a cover as shown in Fig. 1. This cover is provided with a central opening in which bears a pinion, on the cylindrical hub of which is formed a ratchet clutch. The portion of the hub between the pinion and the clutch members forms a neck which occupies the bearing in the cover. The shaft to which it is desired to impart the motion, passes freely through a bore in the hub of the aforementioned pinion, its axis being co-incident with that of the cases. Another clutch is splined to this shaft to engage the clutch on the pinion. This is operated by a lever, shown in the illustration. The connection between the lever and the clutch member may be made in any manner desired, the preferred form being an annular groove, in which are seated pins located in the ends of a yoke attached to the lever. Within the casing is an internal gear, between which and the before-mentioned pinion, is an intermediate gear, the latter being mounted on a stud, carried by a disc having a bearing on the shaft. On the

LATE EFFORTS OF DESIGNERS.

periphery of the disc are ratchet-teeth inclining in the direction in which the shaft revolves. A pawl is provided between the gears and the casing, projects through an opening therein and engages the ratchet-teeth. To the hub of the disc is secured the inner end of the convolute spring; the opposite end being attached to a second disc by a stud. The second disc is provided with a hub which passes centrally through a wall of the casing, opposite the cover. To the outer end of the hub is secured a clutch similar to that on the pinion. It is also provided with a central bore, which passes the shaft as previously described. To this end is also attached an opposite clutch, splined on the shaft, and provided with teeth inclined in the direction in which the shaft rotates. It is also provided with a circumferential groove and is operated similarly to the one already described, except that, as will be seen by the illustration, the lever is differently attached.

Figure 2 is a side elevation of this device taken from the right hand side as shown in Fig. 1. There is an annular flange on the disc last described and within this is located a split ring, the flange and ring forming a friction-clutch. The ends of this split ring have oppositely inclined surfaces, forming between them an outwardly tapering recess. The recess is occupied by a wedge, with a shank, at the inner end of which is a loop provided with parallel inner

walls which engage the hub of the disc and thereby guide the wedge. The wedge is moved into and out of engagement with the inclined surfaces on the end of the split ring by means of a bell-crank, pivoted between ears formed on the casing. The vertical portion of the bell-crank is attached to a lug on the lever, for operating the clutch member on that side of the starter, and the horizontal arm, extends through an opening in the casing, the rounded ends occupying a slot in the shank of the wedge.

In operation the lever last described is designed to disengage its attached clutch member and, by means of the bell-crank, to expand the split ring within the casing, thus clamping the annular flange and preventing rotation of the disc to which the outer end of the spring is attached. While the shaft is in motion the opposite lever is moved to engage the clutch members on that side, which action causes the small pinion surrounding the shaft to revolve. By means of the intermediate gear the internal gear is caused to slowly travel, carrying with it the disc, to which is attached the inner end of the spring, which having its outer end held stationary by the friction clutch, is caused to wind up on the hub to which it is attached. When the spring is sufficiently wound the clutch members causing its rotation are disengaged and the pawl in the casing, as shown in Fig. 2, holds the disc and prevents the spring

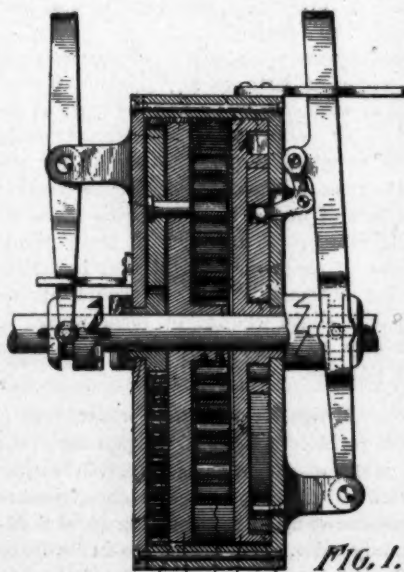


FIG. 1.

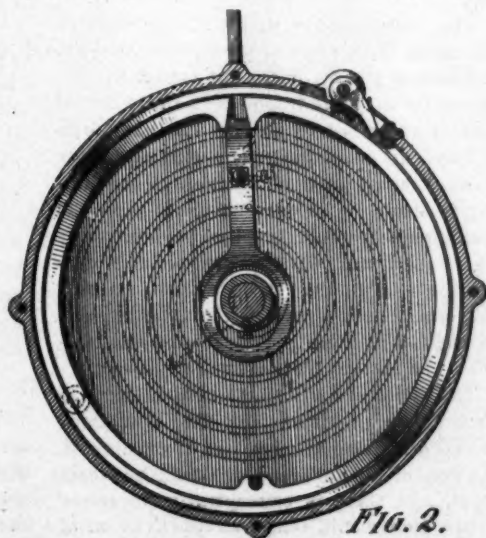


FIG. 2.

LATE EFFORTS OF DESIGNERS.

from unwinding. When it is desired to cause the shaft to revolve, the lever at the right hand side is operated to disengage the wedge from the inclined end of the split ring, releasing the friction clutch and engaging the clutch members on that end of the shaft, thus connecting the disc to which the outer end of the spring is attached, with the shaft. The spring being now wound, having its inner end held stationary and its outer end connected with the shaft, causes the shaft to revolve until the engine has gone through its cycle of operations sufficiently to make its action automatic. The clutch members are then disengaged.

Case Rocking Cylinder Engine

The Case automatic high-speed is the name of a new form of oscillating cylinder steam engine now being manufactured by the New Britain (Conn.) Machine Co. The engine is shown in the illustration. The transparent cut shows the piston directly connected to the crank pin, thus eliminating several sources of friction and a considerable number of parts; namely, the cross head, guides and wrist pin. This type of construction permits a reduction in the number of working parts, those used being of light weight and the result being the attainment of high speed without excessive vibration. At the same time the increased speed reduces the size of the cylinder, while the elimination of the connecting-rod materially diminishes the height of the engine.

The piston being directly connected to the crank-pin travels back and forth through the bore of the cylinder; the latter, by reason of its shape, is free to turn in its casing and is therefore rocked by the piston-rod through an arc sufficient to open and close steam exhaust ports on its face. The cylinder is steam balanced, thus permitting the rocking motion to take place with little or no friction and with no appreciable consumption of power. A long sleeve screwed into and forming part of the cylinder, and through which the piston rod travels, imparts the rocking motion to the cylinder.

The upper end of the cylinder is open, so that steam admitted for the downward stroke acts from the head of the piston to the face of the surrounding casing or steam chest, and there is consequently no steam thrust that would tend to cause friction of

the cylinder against the casing. The lower end of the cylinder is closed but the same thing is accomplished for the upward stroke by the admission, through passages leading from the ports, of a thin film or layer of steam to a small balancing chamber, of equal area with the piston, hollowed out in the bottom of the cylinder. By this method no power is required to rock the cylinder, which is perfectly steam balanced.

The most extreme requirements as to regulation are met by a governor, this mechanism differing from the ordinary type of shaft cut-off governors, inasmuch as it does not diminish the throw of the valve and so throttle the steam on light loads, but has always the same amount of travel, the regulation being effected by its rotating the eccentric on the shaft and thus giving the valve the right amount of lead over the crank. The cut-off valve is of the plug type, perfectly balanced, and made with a slight taper so that it can always be kept tight. Its only duty is to define the point of cut-off, the admission, release and exhaust closing being controlled by the rocking of the cylinder which forms a valve action.

The engine is self-contained, the frame inclosing and protecting the principal moving parts from dirt and mechanical injury, affording also facilities for the most simple and efficient means of automatic lubrication; the lower half of the crank-case forms a reservoir for oil and water, into which the crank-pin dips at each revolution. A reversing attachment is also provided when required.

The engines are built for all purposes and are supplied with casing suitable for attaching to floors, walls and ceilings, as desired. The company is now constructing three patterns, a pedestal engine for use on the floor, a bracket engine to be attached to the wall and a hanger engine to be directly attached to an overhead beam. While neither of these may be all that is desirable for automobile uses, it would appear that but slight change of form would be necessary to make a desirable motor for that purpose.

Design for a Three-Wheeler

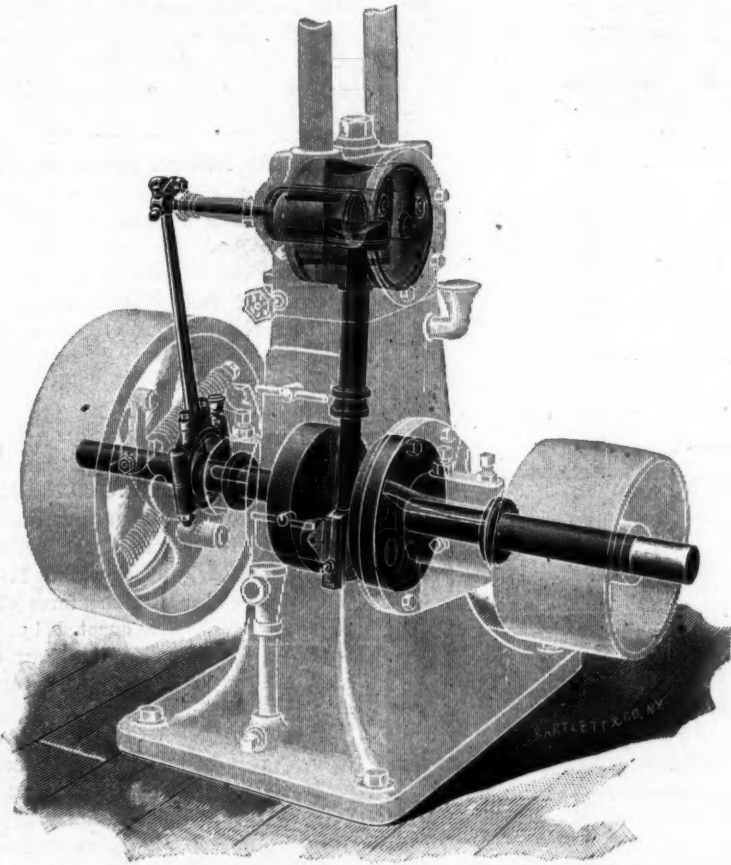
Three-wheelers seem to be gaining favor and much attention is being given by designers to this type. While objections to a three-track machine for use on rural roads certainly exist, there are points in its favor

LATE EFFORTS OF DESIGNERS.

when a reasonably smooth roadbed is obtainable. For instance by virtue of this style of construction the necessity of a flexible frame is avoided and the cost of manufacture is reduced. A machine in which several points are covered with considerable care has been designed by Alden E. Osborne. The principal features are its adaptability of various styles of bodies to the same running-gear and the design of

it practically a part thereof. The pin passes transversely and the shell is fitted with ball-bearings which sustain it, and consequently the wheel itself, on the axle. The shell, therefore, forms a supplemental axle and this in turn oscillates on the main axle, carrying with it the steering-wheel, which may be moved in a horizontal direction to steer the vehicle.

In all the forms of this steering device



the steering-wheel whereby the usual fork construction is avoided and the wheel attached to a rigid member of the frame.

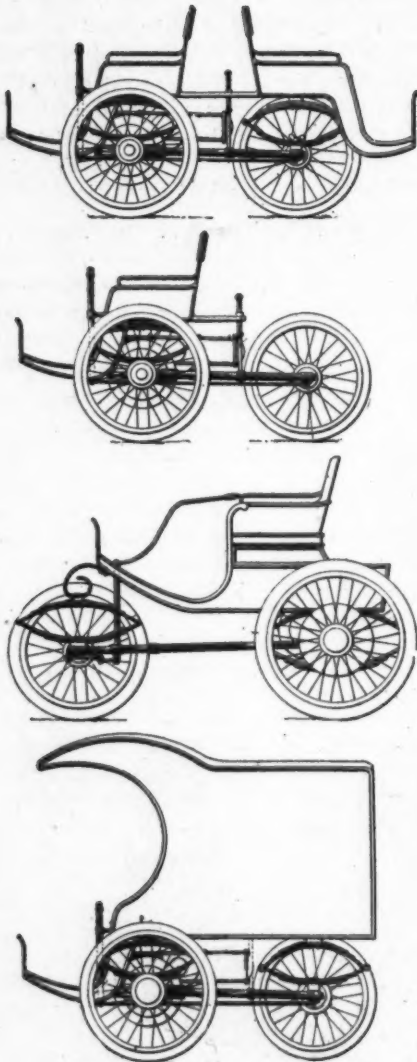
Several modifications of the design of this hub are shown, but the one preferred is here illustrated. The hub is fitted with ball-bearings to turn around a cylindrical shell fitted within it. The shell is held by a pin to oscillate on a stationary axle, each end of which is attached to the side members of the frame in such a way as to make

an arm is attached to the shell whereby the shell may be turned to direct the steering-wheel. No particular motive power is prescribed. It appears that all the appliances may be attached to the frame-work, so that the body may be left free from mechanism and changed as desired.

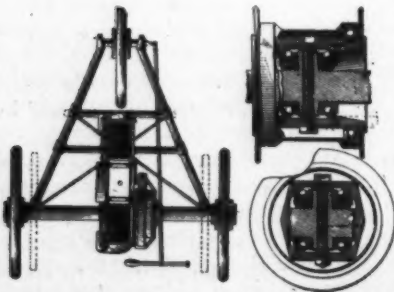
New Steering-Wheel Hub

Andrew Benson, of Chicago, the inventor of a vehicle described in these columns

LATE EFFORTS OF DESIGNERS.



Styles of Osborne Vehicles.



Plan View of Osborne Frame.

some time ago, wherein an electric motor is used for starting the engine and the motor becomes a dynamo and re-charges the batteries as soon as the engine reaches its normal speed, has invented a hub for a steering-wheel, wherein the center of the knuckle lies within the plane of the center of the wheel. The device is one of the simplest of this nature. As is usually the case in this style the barrel is large in diameter and provided with an internal sleeve, upon which are supported the bearings to facilitate the rotation of the wheel, and within which is a vertical pillar, also provided with ball-bearings upon which the wheel is oscillated.

An Indicator for Gas Engines

The Industrial Review of Paris describes an attachment designed by R. Mathot and made by Paul Garnier, by which a Watt indicator can be used to give a continuous diagram of successive explosions.

The variable nature of the explosive mixture has heretofore rendered the diagrams taken unsatisfactory to judge the operation of the engine by. As applied to automobile motors there is the further trouble that the rapidity of the ignitions renders it difficult to take the cards. The Mathot attachment consists of an auxiliary drum pivoted to the frame of the indicator and slowly rotated by clock-work. It registers both the number and the force of the explosions, which are denoted by the long ordinates in the cards, the short ordinates representing miss-fires. The card shows also the initial pressures.

With diagrams obtained in this manner it is possible to detect the influence of such factors as the section of the gas conduits and ports, and the sensibility of the indicator, the value of the explosive mixture and the best time for ignition.

The diagrams shown in Figs. 2, 3 and 4 were taken upon different engines and correspond to a complete turn of the drum, which occupied about two minutes. Fig. 2 denotes that the gas pipes were too small, so that the explosion failed to attain their maximum power without a gradual decrease of speed. Figs 3 and 4 each include two parts, the left-hand curves showing certain defects and the right-hand the results of remedying them. The trouble in Fig. 3 was a too small gas pipe. In

LATE EFFORTS OF DESIGNERS.

Fig. 4 the engine was running with half-charge and the exhaust pipe was too long, so that the motor retained an objectionable quantity of the products of combustion. Other diagrams which are not reproduced cast light on the influence of the sort of ignition tubes used, the combustibility of the mixture, the effect of clearing out the burnt gases, etc.

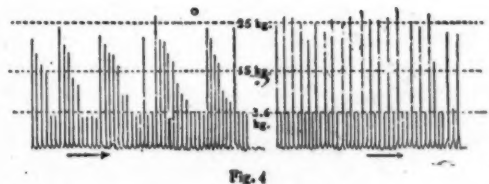
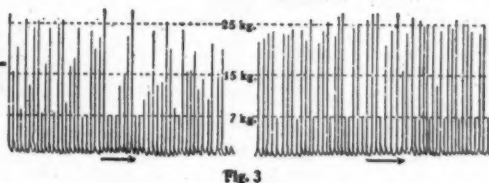
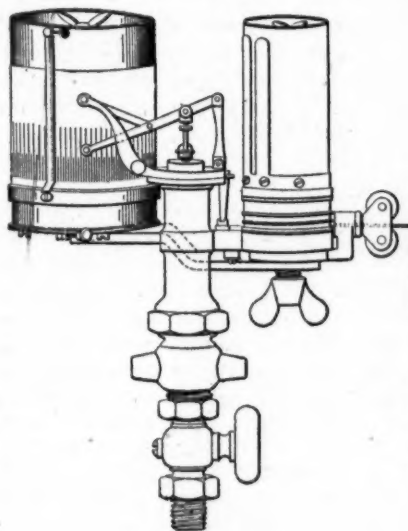
The same inventor has devised a special indicator for automobile motors, adapted to any speed. In this the paper is fed continuously from one cylinder to another, the pencil resting against a third cylinder over which the paper passes. There is an auxiliary pencil to trace the line of atmospheric pressure. In taking the diagrams the speed of the paper is so regu-

stood, however, and reply was made which did not convince him. He has since forwarded a sketch of his idea and investigation shows that he was right. The accompanying drawing should be substituted for the one shown as Fig. 5 in the series of articles referred to. Mr. Purdy has our thanks for calling attention to the matter.

Success of Self-Propelling Fire Engines

Another automobile fire engine has been added to the equipment of the Hartford fire department. All of the engines so far produced have been made by the Manchester Locomotive Works, of Manchester, N. H. There is room at the top for some other maker.

For almost half a century inventors



lated that the ordinates representing the explosions are distinct one from another. By using a sensitive spring it is possible to detect the consequences of resistance to the inflow of gas as well as to the exhaust and draw useful lessons therefrom.

The accompanying drawings were reproduced from the American Machinist.

Mr. Purdy Was Right

About three weeks ago S. E. Purdy, of Grand Rapids, wrote that he had discovered what he believed to be an error in one of the drawings recently published with a description of "The construction of a bicycle motor." His point was misunder-

stood, however, and reply was made which did not convince him. He has since forwarded a sketch of his idea and investigation shows that he was right. The accompanying drawing should be substituted for the one shown as Fig. 5 in the series of articles referred to. Mr. Purdy has our thanks for calling attention to the matter.

The automobile fire engines of Boston were built in 1897, and have been in continuous service since. They weigh nearly 9 tons each and are, of course, much heavier than any of the engines drawn by horses, and yet experience has demonstrated that

LATE EFFORTS OF DESIGNERS.

they may be handled and placed in position with less difficulty than a horse engine. The Boston engines answer second alarms in the dangerous district and are considered more reliable hill climbers in all weathers than horses.

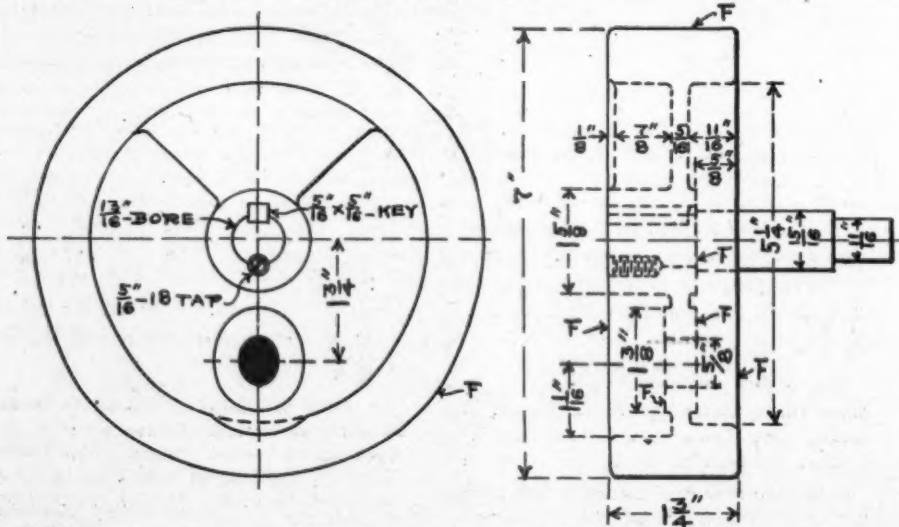
The largest size automobile engines when at work at fires throw an average of about 870 gallons of water a minute, or 52,200 gallons an hour, while the average horse engine usually throws less than half that amount of water. Upon exceptional occasions when throwing two streams simultaneously horse engines have been known to play almost 600 gallons a minute, but even this quantity is well under that discharged by the self-propelling engine under normal conditions. The value of the propellers has been conclusively demonstrated at hot and extensive fires where the streams from their 1½-inch or 2-inch nozzles appear to have several times the effect of those from the 1½-inch nozzles of the horse engines.

Some truly remarkable showings have been made. On one occasion one of the propellers played over 1,500 gallons a minute, or 90,000 gallons an hour, as compared with about 1,000 gallons a minute, or 60,000 gallons an hour, by the largest and most powerful horse engine procurable. On trials through 100 feet of hose the stream from the propeller was projected through a 1½-inch nozzle to a horizontal distance of 349 feet, and through a 2-inch nozzle to

nearly 320 feet, whereas a 1½-inch stream was thrown into the air to a height of 236 feet. When the streets are clear the self-propelling engines invariably distance all the hose wagons drawn by horses. The machines will readily attain a speed of a mile in 3 minutes, and at tests have shown speed above 25 miles an hour. Steam being the propelling power, is carried at all times on these big engines, and as a rule the horseless engine can be depended upon to be started on its journey to the fire within 7 seconds after the alarm has sounded.

The working pressure is 125 pounds to the square inch, and the cost of maintaining about 100 pounds of steam is considerable; yet it is declared in no case to be more than the cost of feeding three horses, and the officials of New Orleans, who recently made a careful comparison, found that the horseless engine cost but \$27 a month, as compared with \$60 a month for the machine drawn by animals.

There are at present seven self-propelling fire engines in actual service in this country, and that this class of apparatus is expected to grow in popularity is attested by the fact that several firms are now placing automobile hose wagons. The heavier first cost will, of course, hold against the self-propelling engines in some instances, but this would appear to be offset by the reduced operating expenses. Then, too, the self-propellers have demonstrated their



Drawing referred to in Mr. Purdy's letter. See previous page.

CHAIN TRANSMISSION OF POWER IS SATISFACTORY

ONLY when frictional rivet surface and tensile strength are large in proportion to the working load.



NO. 155 FOR LIGHT RUNABOUTS

Equip your machines with large chains and avoid trouble.
Diamond Chains have large nickel steel hard rivets, are accurate and highly finished.

The Automobile and Cycle Parts Co.

DIAMOND CHAIN FACTORY
INDIANAPOLIS, IND.

ability to go through snow in which half a dozen horses could not have drawn the lightest engine. Indeed, their great power has sent the Boston auto engine through the worst snow blockades which have occurred in that city in four winters. Finally, the introduction of self propellers sounds the knell of the unsanitary conditions prevailing in those engine houses where the firemen have been obliged to sleep in the same building with the horses. We are indebted to the Scientific American for most of the facts here presented.

Motor Age Catalogue Department

Readers of this paper are notified that the publishers will be glad to forward, on request, the catalogues of any or all of its advertisers.

The object of the department is to place the buyers and sellers in communication with each other with as little trouble as possible to each.

It is unnecessary to write a large number of letters to individual concerns.

Send to the Motor Age a list of the ad-

vertisers whose catalogues you require and enclose stamps to cover postage. This will save you the trouble of writing a number of letters and the catalogues will reach you by return mail.

The Motor Age catalogue department facilitates business between buyer and seller by supplying the catalogues of any of its advertisers which may be required by readers. Send a list of the makers whose catalogues you require and enclose stamps to cover postage.

Do you want to buy an automobile, cycle, engine, lamp, tire, or anything in the line of accessories? If so make your wants known to Motor Age which will at once place you in communication with reliable people who have the goods for sale.

Joseph Mandery, of Rochester, who got into the automobile business early, is now building an addition to his show rooms on South St. Paul street, next door to his other extensive business. Mr. Mandery recently secured the agency for the Electric Vehicle Co.'s goods.

AUTOMOBILES AND HYSTERIA IN PARIS

Charles R. King, a mechanical engineer, and apparently an American of long residence in Paris, a vehement opponent of men who make a race-track of the streets, thus depicts, in a letter to *MOTOR AGE*, the condition of affairs in the French capital:

In external contour all racing trucks are very much alike and open to little alteration for fashion's sake, yet "le snob de l'automobile" has recently realized a perfect triumph of effect in a new form of mud wing. This wing is of immense size, resembling a spread bat's wing or ship's sail. When vehicles, so equipped, pass the Arc de Triomphe, the riders, with their back hair smoothly parted down the middle, look around to seek the admiring or awe-struck looks of the loungers. Latterly a great many motor car owners have found that their vehicles created so little attention that the idea has occurred to them to make a show of mechanical parts about the carriage, and now the passers-by may see rows of sight-feed lubricators placed in the most prominent positions, and polished sheet-brass reservoirs held by brackets high above the tips of the carriage seats.

The colors of the mechanically propelled carts are of the most wonderful that it is possible to conceive; every shade of the rainbow, pale yellow, green, straw-yellow, pale pink, pale shades of ultramarine-blue, vivid salmon, carmine, crimson lake and vermilion. White is the most prevalent color. Where striping is resorted to the bands are about three inches deep. Some of the most recent cars are in natural polished wood for the body and vermilion for the wheels. A few are in polished aluminum, but this custom appears to be on the wane. If the vehicle owners fail to create the desired effect in drawing people's attention it is not for want of glaring colors.

The uncovering of the exhaust has been a telling means of creating attention. In others the noise is a mere accident of a poorly designed muffler. In the afternoon the roar of the hundreds of gasoline automobiles passing on the Champs Elysees avenue is such that it penetrates to the most secluded rooms of the adjoining houses, and out on

the street the air is infected with the odor of petroleum. In justice it must be said that here and there may be noted a rare vehicle, the makers of which have suppressed the fearful rattle and roar of the exhaust to a really wonderful degree. These, however, are exceptional, and it is easy to see that the riders do not belong to the army of "snobs." It is remarkable how closely allied is the appearance of an automobile dude with the custom of furious driving.

Here we notice a 25-horsepower racing machine of the ugly popular type, driven by an old man and his wife who look like a Kentucky couple in Paris for the first week. The old man "potters" around the Arc at 3 miles an hour, looking all around him and steering in a sleepy manner. How much would the automobile be a delightful pleasure-carriage if there were many more such drivers! The tyrannical juggernaut of the streets would hardly be known. At present we are (in France, if you please) at the zenith of citizenship-abuse by the howling snob-drivers of gasoline vehicles; so much so that the prefect of police has abandoned his abject servility to the rich owners of these vehicles and proposed to compel all racing carts to show a distinctive number before and behind, just as was a year ago enforced for the ambling market-carts which rarely got beyond a pace of 7 miles per hour.

Moreover, any motor cart, of any kind which, from its construction, could exceed the present ignored limit of 19 miles per hour for the open country, is to bear two number plates to be issued by the administration. Now, as there is hardly a motorcycle which cannot exceed that speed, or does not do it every day, it will be interesting to note how many red-handed gentry will manage to evade the law.

The portentous trumpet (trompe for those who worship the French vocabulary) is no longer to use its abusive power of sweeping the main roads and streets clear of everything which circulates thereon in time of peace. It is not to be allowed, as heretofore, the right to lay all the deaths at the door of those who stupidly do not bolt out of the way in time for the passage

ADVERTISEMENTS.

of Count Hunt-the-Wolf, Monsieur Low-beat Johnson, Monsieur Reaming-Knife and other potentates of the Juggernaut Club.

We shall hear more from the writers who spin out the hysterical nonsense about the skill and prowess, the cool head, the wonderful eye, the courageous daring, the heroic character, etc., of the chauffeurs who never run over so much as a fly, and who, by the way, are so speedy at getting away from the authorities when they do leave a corpse in the road behind them. When a functionary charged with the public order makes an endeavor to enforce the regulations he earns the title from the sporting gentry of "Motorphobist." A little perception will show that these sportful folk run near to deserving the appellation of humanophobist or citizenphobist.

It is perhaps hardly necessary to point out to any really mechanical man that at 30 to 45 miles per hour (the tourist speed on French roads despite regulations) with an object on wheels weighing several tons, it cannot be swerved out of its path to avoid a person who is moving on the road, even if it were the wish of the driver to do so, but who, more often, is possessed by a vehement anger against the pedestrian's presence, a slowing down of the speed and a consequent loss of seconds. In the recent race at Berlin from Champigny the professional drivers could not even stop their trucks at the slippery places in towns, and would have killed scores of enthusiasts had not these latter made a stampede in time.

Increased water capacity will be given the new patterns of Locomobiles by carrying the tank up flush with the top of the body. The running gear will be strengthened by the use of heavier tubing and other means; spur gear differentials will be used and inclosed instead of the open bevel gears; there will be a feed-water heating coil in the muffler; the cylinder lubricator will be larger; there will be a valve by which the fire may be cut off from the seat and the burner head and sides will be stamped in one piece.

The Champion Cycle Co., of Brooklyn, is making room to undertake the sale of automobiles and motor bicycles. The place is located at 68 and 70 Montague street and is in the best residence section of Brooklyn on the street leading from Wall street ferry. Albert Schock, the manager, says he has a

A Shining Light in Automobile Society

THE Dietz Lamp



IT sometimes happens that the man in the motor vehicle has lamp troubles of his own. We say "sometimes," because in most cases automobiles are equipped with the **DIETZ** lamp—the satisfactory kind.

As the result of practical tests, most of the experienced manufacturers are using or will adopt the

DIETZ

exclusively. If you want to know more about the lamp made by this reliable company, who have been making lamps for more than half a century, write to

R. E. DIETZ CO.

37 Laight St. :: New York

ADVERTISEMENTS.

room for storing at least 50 automobiles and he hopes to make the place a supply station.

Dr. Carl H. Reed, who has charge of the advertising department of the Electric Storage Battery Co., Philadelphia, is a lesson in the matter of politeness to representatives of trade papers, and his example might be followed by many who look upon the advertising man as a scourge instead of advance agents of a more active business and prosperity.

Henry L. Trebert, general superintendent, and T. E. Griffin, sales manager, will represent the Stearns Steam Carriage Co. in the endurance test from New York to Buffalo. Trebert is designer and builder of the Stearns carriage and Mr. Griffin has had valuable experience in automobile racing during the past two years.

Ellis & Turner, who made an automobile at Peoria and have been testing it for the last month, have covered 800 miles at a cost of \$5.20 for gasoline and 25 cents for repairs. They are said to have received offers of financial backing for the establishment of a factory.

The Hipwell Mfg. Co., of Pittsburg, has secured the agency for the National Automobile Co.'s goods, and will also manufacture vehicles of all forms. Machinery is being installed and the company expects to be well under way this fall.

The branches of the Mobile Co. have received advices that all of the new vehicles sent out after this time will be advanced in price \$100. This season's models, now on hand, will be sold at the old price.

It is expected that the Winona Wood Rim plant, recently destroyed by fire, will be rebuilt at LaCrosse, Wis. It is said that the company has lately employed as many as 100 men.

The Buckeye Mfg. Co., of Anderson, Ind., has decided to erect a factory at Union City, Ind., for the manufacture of gasoline vehicles.

An addition, 213x80 feet, is being made to the factory of the Automobile Co. of America, which builds Gasmobiles.

Kequa & Sons, of Springfield, O., are reported to be about to engage in the manufacture of automobiles.

A New York exporter asks for the address of the manufacturer of the Featherweight bicycle wrench.

COMFORT

WITH

SPEED

IS THE

CUSHION

FRAME

MOTTO

THE CUSHION FRAME is positively the greatest bicycle invention since the advent of the pneumatic tire. It practically increases the resiliency of the tire four fold without in the least detracting from the speed or power of the wheel (as compared with the so-called rigid frame). The most enthusiastic converts to the Cushion Frame are the old-time speedy "get there" riders who at first "scoffed" the idea of COMFORT being combined with "speed and power" in a bicycle. :: :: :: ::

HYGIENIC WHEEL CO.

220 Broadway, NEW YORK

Owners of the Cushion Frame Patents.

ADVERTISEMENTS.



Dyke Jump Spark Cell - \$3.50
Dyke Jump Spark Plug .99
A. L. DYKE
Office, Linmar Bldg., St. Louis

Only \$2.98 And Three Hours on the
EMPIRE STATE EXPRESS
PAN-AMERICAN TO SYRACUSE.
Don't depend on special exhibition automobiles
See **The Century** At The Works.

GASOLINE MOTORS

For Bicycles, Launches, Etc. Our 3 1/2 H. P. light Motors for Runabouts. Our Transmission Gear. All parts to build Automobiles, either finished or Castings. Carburetors and Mufflers.
MORGAN MOTOR CO
60-54 Columbia Heights, BROOKLYN, N. Y.

STYLISH AND DURABLE
Lamps for Automobiles
GRAY & DAVIS
Amesbury, Mass.
SEND FOR CATALOG "B"

The Geneva Automobile & Mfg. Co.
GENEVA, OHIO,

Steam Wagons, Running Gears, Engines, Boilers and Parts. Write for prices.

What is **AUTOMOBILISM?**
All who are interested in that question should consult the
"Motor-Car World"
which each month reviews the progress of the new Locomotion throughout the World. Published at 186 Fleet Street, London, England. Annual Subscription, post free to the United States, one dollar.

STANTON STEAM CARRIAGE.

The Stanton Mfg. Co. claims that in its carriage are combined the qualities of workmanship, material and mechanical appliances that go to make... **The Ideal Motor Wagon**
STANTON MFG. CO., Waltham, Mass.

DIXON'S GRAPHITE COMPOUND

Is NOT A LUBRICANT. It is for making tight steam or gas joints. Graphite is not affected by steam or gasoline. Joints can be opened with ease at any time.
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Automobilists coming here arrange ahead with us for storage, supplies, repairs. Splendid location. Efficient service. Agents for new and second-hand automobiles. Will consider representation for good concerns.

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1097 Ellicott Square :: :: 320 Franklin Street

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Enamels and Colors in Japan
Are the most durable for Automobile Bodies and Gears. Send for sample card.
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154 West Van Buren St.,
CHICAGO : : : : ILLINOIS

THE WORD Locomobile
Refers to Steam carriages made by the **LOCOMOBILE COMPANY OF AMERICA** only. It is a trade mark. :: ::
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There is no **SUCCESS** like
KEATING MOTOR BICYCLE SUCCESS
KEATING WHEEL & AUTOMOBILE CO.
MIDDLETOWN, CONN.

MILLER ROLLER BOILER • • •
TUBE EXPANDER
For expanding 3/8-in. Copper Boiler Flues in Automobile boilers. \$4.00 Each.
97-99-101 CHAS. E. MILLER, New York
Reade Street. City ..

MODERN CYCLE REPAIRS

ONE DOLLAR TO CYCLE AGE
OR MOTOR AGE SUBSCRIBERS
THE CYCLE AGE - CHICAGO

Sheet Steel Parts

— FOR —
Bicycles and Automobiles. Special stampings made from drawings or blue prints, all of a superior quality. Send for Catalogue.
THE H. A. MATTHEWS MFG. CO., Seymour, Conn., U. S. A.

THE MOTOR WORLD

Devoted to the Automobile and Kindred Interests.
NOT LIKE THE OTHERS
It's readable and you can understand what you read
PUBLISHED EVERY THURSDAY AT
129-135 TRIBUNE BUILDING, NEW YORK
\$2 Per Year. Sample copies gratis.

The Latest Steam Vehicle

The Prescott Automobile Manufacturing Co., of 99 Chambers street, New York, has been operating for the last year, and has succeeded in perfecting a line of steam carriages. The specifications of the single machine are as follows: Weight, 1,050 pounds; 66-inch wheel base; 28-inch wheels, 3-inch tires, Fisk; 16-inch boiler, fire tube, dry plate; 2½-inch bore by 4-inch stroke, link motion; 200 pounds nominal, geared, 12-14 to 30; seamless copper tanks; 10 gallons gasoline; 35 gallons water; tanks in front, compartments in water tank; 24-ounce copper on-water tank; hand pump, crosshead pump with large inlet, steam pump on compression tank, throttle lock, started from seat; compensating spur gear; generator and pilot light, special; combination slat, roller chains, double acting brake; reaches 12 and 16 gauge, telescoped arches, 10 gauge, 4-inch flange hubs, water tank gauge, Bundy lamps; price, \$1,000.

The president, Mr. Prescott, has been a successful manufacturer and financier in various large enterprises, and is known as the manufacturer of the celebrated Enameline stove polish, etc. Frank F. Weston, secretary and general manager, has been prominently identified with the bicycle business for many years, and during his connection with the Eclipse Manufacturing Co. successfully introduced and marketed the coaster-brake.

Catalogue Department

THE MOTOR AGE has established a catalogue department and will forward the catalogues of any or all advertisers on request.

The objects of this department are as follows:

1. To save the reader the trouble and expense of writing to each individual concern whose catalogue he may need.
2. To place advertisers in direct communication with prospective purchasers.

Applicants for catalogues will please state specifically the names of the concerns whose catalogues they desire and enclose stamps to cover postage.

Applications should be addressed to the Catalogue Department, MOTOR AGE, Monon Building, Chicago.

20th Century OIL AND GAS
Bicycle, Driving and Automobile
HEAD-LIGHTS
For sale by ALL JOBBERS AND DEALERS
20th Century Brand of Carbide.

MISCELLANEOUS

Advertisements under this head 5 cents per word first insertion; 3 cents per word each insertion thereafter. Cash with order. Express orders, postoffice orders or stamps received.

FOR SALE

FOR SALE—Automobile (Winton) surrey, used one season, in first-class condition. Reason for selling, want faster machine. Address W. H. LAUGHLIN, Canton, O. 4

FOR SALE—A new automobile; right up to date; will sell cheap. For particulars address V. W. GRUMMAN, 583 S. Mead st., Zanesville, O. 1

FOR SALE—A first-class bicycle and sporting goods stock. F. W. HAASE, Decorah, Ia. 1

FOR SALE—One new mobile, \$600.00; one second-hand mobile, in good condition, \$400; one Orient 2½ h. p. tricycle, one Orient 2½ h. p. quadracycle. All in good condition. W. A. CARR, 819 Wright St., Indianapolis, Ind. 1

FOR SALE—The Automobile Storage and Repair Co., 57 West 66th St., New York, have new and second-hand steam, gasoline, and electric carriages constantly on hand and have always some spec. at bargains.

FOR SALE—Winton automobile, fall 1900 model, in good order, \$800. Will teach purchaser to operate and accompany him home. F. E. LOW, Stubenville, Ohio.

NO. 2 LOCOMOBILE, first-class condition \$485.00; No. 2 Locomobile, almost new, been run 75 miles, \$650.00; brand new "Locosurrey," \$1,075; Orient quad, \$300. I personally guarantee all the above. In stock ready for immediate shipment. A. L. DYKE, Auto Supplies, office Linmar Bldg., St. Louis, Mo.

TWO BARGAINS—One of our model No. 1 carriages used but a few miles for demonstration purposes. One model No. 2 Locomobile with brand new, latest style engine, new compensating gear and many improvements. Write us for prices on these and we will surprise you. LOOMIS AUTOMOBILE CO., Westfield, Mass. 2

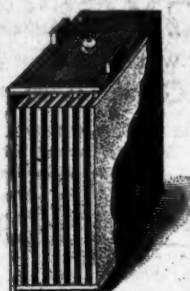
WANTED

AGENT WANTED to purchase second-hand bicycles. Address INTERNATIONAL BICYCLE CO., Shanghai, China. 11

WANTED—A second-hand Gasoline Automobile, must be in good order and very low in price; give full particulars in first letter. S. A. SMITH, Winnebago City, Minn. 1

WANTED—A competent superintendent who is connected for a long time with a leading steam carriage maker is open for an engagement. Can design and construct any kind of engine or motor and owns some patents in that direction. The best of references as to ability and conduct given and will be ready to take a position at short notice in any part of the country. Address, "SUPERINTENDENT," care of Motor Age, 150 Nassau Street, New York. 2

ADVERTISEMENTS.



S. & T. Storage Batteries

No Electromobile is perfect without them. Greater efficiency for less weight and longer life than any other battery. Each section of element is surrounded by a wall of porous material, thus preventing the deterioration of plates caused by heavy charging and discharging, which is the cause of the active material becoming loose and dropping in the bottom of the Jar. :: :: :: :: :: :: ::

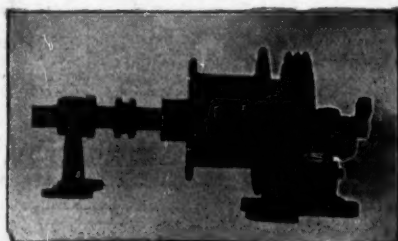
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167 Dearborn St., Suite 411,

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All Kinds of Storage Batteries Repaired.

Not a Puzzle



Which is the best Engine and Transmission, its easy, its the

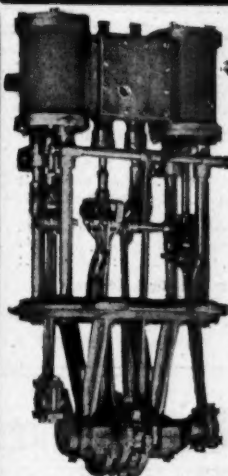
BUFFALO GASOLINE MOTOR CO'S

Four cylinder non-vibrating mechanically operated inlet valves, and

EMPIRE GEARLESS TRANSMISSIONS

Only guaranteed transmission made

BUFFALO GASOLINE MOTOR CO.
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Time Trouble Money Saved!

This the "Xander" Auxiliary Hand Pump will accomplish, easily attached, fill the boiler in two (2) minutes, only

pump entirely independent of feed pumps on the engine. Cheap, reliable, weighs only five (5) pounds, easily attached to any steam carriage. The "Xander" Steam Engine, two cylinder, best on the market. Automobile parts, boilers, first-class machine work, etc. Agents wanted everywhere. Write to-day to

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We have
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50 TONS

of CUPS
CONES
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and Repair parts
of all kinds.

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ADVERTISEMENTS.

Dyke's Float Feed Carburetor



Is acknowledged to be the best carburetor that money can buy.

It gives more power because it gives a proper mixture. Suitable for engines from 3 to 20 H. P. We make a special one for engines up to 50 h. p., also used for boat

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Guaranteed to give satisfaction or your money refunded. Send stamp for new printed matter. Gasoline engines from 3 to 10 H. P. Running Gears, Automobile Supplies, Etc.

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SUPPLIES AND EXPERT REPAIRS.

Visiting Automobilists to Buffalo can depend on safe and courteous treatment. Fine residence neighborhood. Within a block of the Buffalo Automobile Club, and central. Can accommodate 100 Autos. Charging station and all conveniences for all styles. Charges moderate. Correspondence solicited. :: :: :: :: :: :: :: ::

Official Automobile Blue Book Station.

THE AUTOMOBILE STORAGE, INSPECTION
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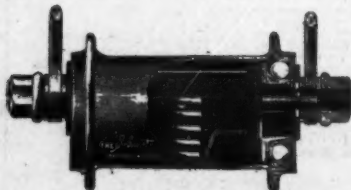
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Of 4 inch x 4 inch motor, described in Motor Age, \$48 with Blue Prints. Also Marine and Bicycle Motors.

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FIRST TIME PRIZE



Pullman
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July 4, 1901
Won on this
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Won First Time Prize May 30th, 1901, in Century Road Race. Reduced record, which stood for 4 years, by 30 minutes.

Substantiates our claims, doesn't it? For full particulars address

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THE RACYCLE

THE PERFECT WHEEL.

Seven models, with a range of prices to suit all purses. Write us.

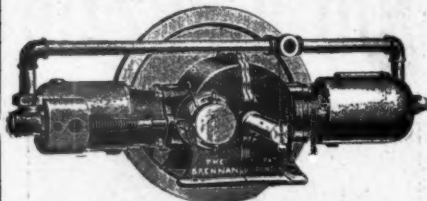
THE MIAMI CYCLE & MFG. CO.,
Middletown, Ohio.

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We can quote a very interesting price on automobile fenders. Write us for
AUTOMOBILE SUPPLIES

Eastern Automobile & Supply Co.
67-71 Fountain Street, Providence, R. I.

The BRENNAN WATER-COOLED MOTOR ..



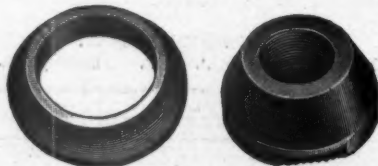
Manufactured 4, 5 and 7 H. P.
BRENNAN MFG. CO., SYRACUSE, N. Y.

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FOR MOTOR VEHICLES



THE BALL BEARING CO.
BOSTON, MASS.

AUTOMOBILES

WHAT ARE THEY AND
WHAT WILL THEY DO ?

It compares answers, without the use of technical language, and a reliable picture of the future of the automobile and its parts is given in a special number of

THE MOTOR AGE

THE AUTOMOBILE AUTHORITY OF AMERICA

124 Dearborn Street, CHICAGO

ADVERTISEMENTS.

ESTABLISHED 1849.

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— AGENTS FOR CLOTH MILLS —

Visitors to Pan-American Should Stop At

Park Inn

1392 Amherst St., Buffalo. (Opposite Park Meadow.)

Beautifully situated in a grove of native oaks bordering on the extensive Meadow of Delaware Park. This is a fine modern residence, with large grounds lately occupied by the Country Club and fitted up by them, with extensive Kitchen and Porches, Porch and interior dining rooms. A thoroughly good Cuisine is a prominent feature of the restaurant.

A few large rooms en suite, large closets, baths, etc., (sanitary plumbing) also single rooms, are now ready for guests. Special rates made to long time guests.

By accurate measurement, PARK INN is but $\frac{3}{4}$ of a mile east of Amherst St. and Delaware Ave. gate (east gate) of the Exposition grounds. The south side of Amherst street is formed by Delaware Park, thus making a delightful walk to and from the grounds.

Trolley cars running direct from Railroad Stations to the Exposition grounds pass within five hundred feet of the INN. The N. Y. C. Belt Line trains are within two blocks of the INN.

Take Main-St.-Pan-American, or Jefferson St. cars to Parkside Avenue and Amherst Street, or N. Y. C. Belt Line to Parkside Station. (Ask for "Belt" that stops there), and walk two blocks south to Amherst Street.

We have a building on our premises which will accommodate twenty Automobiles

JOHN C. DUNHAM, Manager.

Parts at a Bargain....

The advertiser offers for sale at about 40 per cent below cost the following

NEW GOODS

which were purchased for experimental purposes only:

Two 15x15 boilers, with steam superheaters, each	\$80 00
One 15-inch Milne burner with pilot light	25 00
Two water-level regulators, each	10 00
Two Locke fuel regulators, each	3 50
Two sets glass fittings, set	3 50
Two injectors, each	3 00
Two sets air and steam gauges, set	3 00
Two 8-inch gongs	3 50
Three sets water tanks, set	5 00
One 19-inch boiler and burner	150 00

All in splendid condition. Can be seen at any time in Chicago.

Address STEAMFITTINGS,

Care of MOTOR AGE, Monon Building, CHICAGO.

• BUFFALO'S MOST LUXURIOUS HOTEL •

The Lenox

North St., Near Delaware Ave.

ABSOLUTELY FIREPROOF.

Located in the most aristocratic section of the city and of all permanent hotels is nearest to the Pan-American Exposition. A strictly high-class and thoroughly modern hotel, conducted for those who want the best.

EUROPEAN PLAN.

GEORGE DUCHSCHERER - PROPRIETOR.

Headquarters: BUFFALO AUTOMOBILE CLUB.



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Of any of the advertisers in this paper
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DYKE'S
"WATERLIGHT"
Saves your boiler.
Electric Lamp, Battery and Button complete, ready to attach to any steam vehicle.

PRICE
\$5.00

A. L. DYKE, Office Linmar Bldg., ST. LOUIS.


The popularity **OLDSMOBILE** has become so marked, that we take this opportunity to notify all imitators and infringers that, while our motor is covered by our engine and designed patents, we have a number of applications for patent upon the mechanical improvements in our device, which are allowed, covering nearly every part of the machine.



Safe for child to operate.

We have separate catalogues for Stationary and Portable Engines.

FULLY GUARANTEED.
OLDS MOTOR WORKS
50 Concord Ave., DETROIT, MICH



BECOME POSTED

All well posted persons say the
Harris Hubs

Do what no others can
E. T. HARRIS
535 W. 15th Street, CHICAGO

THE MARSH MOTO CYCLE LEADS THEM ALL.

If you want to be in the front row in the Motor Cycle business, write at once and secure the agency for the Marsh. We want live, hustling agents in every part of the U. S.

PRICE \$200. Immediate delivery. Write for our new catalogue and terms to agents.

Motor Cycle Mfg. Co. - Brockton, Mass.

Gasoline Carriage Wanted

The advertiser would buy, at satisfactory price, a second-hand gasoline carriage, of an owner who would tell the truth about his reasons for selling. Not afraid of any ordinary troubles, having enough knowledge to remedy them. Please give details and price, by mail only, to :: :: :: :: ::

F. B., 5524 Madison Avenue, - - - - CHICAGO

Yellowstone Park...

Extended tour, leisurely itinerary with long stops in the Park. Private coaches for exclusive use on the drive. Pullman sleeping and dining cars. Established limit to number going. Escort of the American Tourist Association, Reau Campbell, General Manager, 1423 Marquette Building, Chicago. Colorado and Alaska tours also.

Tickets Include all Expenses Everywhere.

Train leaves Chicago via Chicago, Milwaukee & St. Paul R'y., Tuesday, July 9, 10:00 p. m.

NEW WABASH EQUIPMENT.

The Wabash Railroad has just received and placed in service on its lines running out of Chicago the following new equipment:

Eight combination baggage and passenger coaches, thirty palace day coaches, ten reclining chair cars, three cafe cars and two dining cars. The majority of these new cars are seventy feet in length, and fitted with the latest style wide vestibules. They have six-wheel trucks with steel wheels. The cars are finished in the finest selected Jago mahogany. The lighting is by Pintsch gas with the exception of the cafe, dining and some of the chair cars, which are unusually well lighted by electricity, the fixtures being especially designed for these cars. The dining cars will seat twenty-nine persons and have ample kitchen space. The cafe cars will seat eighteen persons in the cafe, and have a library and smoking room in the observation end of the car which will seat fourteen persons. These cars also contain a private cafe with seating capacity for eight persons. These new cars represent the highest stage of the development of modern car building. Nothing has been omitted and no expense spared that would add to their luxurious elegance, or to the comfort and convenience of the patrons of the Wabash road.

No line is now better equipped than the Wabash for handling business to the Pan-American Exposition. Write for a copy of Pan-American folder containing a large colored map of the exposition grounds and zinc etching of the principal buildings.

F. A. PALMER,
Asst. Gen. Pass. Agt., Chicago, Ill.

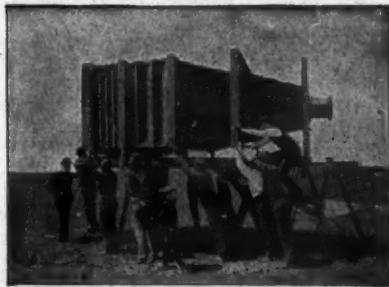
Faster than ever to California

CHICAGO & NORTH-WESTERN RAILWAY

THE OVERLAND LIMITED leaves Chicago 6:30 p. m. daily via Chicago-Union-Pacific and North-Western Line, arrives San Francisco afternoon of third day and Los Angeles next morning. No change of cars; all meals in Dining Cars. The Pacific Express leaves 10:30 p. m. daily. Personally conducted excursions every Thursday from Chicago and every Wednesday from New England. Inquire of any ticket agent or address

461 Broadway, New York; 601 Chestnut Street, Philadelphia; 368 Washington Street, Boston; 301 Main Street, Buffalo; 212 Clark Street, Chicago; 435 Vine Street, Cincinnati; 507 Smithfield St., Pittsburg; 234 Superior Street, Cleveland; 17 Campus-Martius, Detroit; 2 King Street, East Toronto, Ont.

LARGEST CAMERA IN THE WORLD



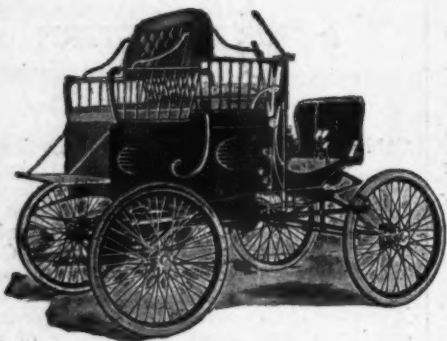
WAS CONSTRUCTED ESPECIALLY
BY ORDER OF THE

CHICAGO & ALTON

RAILWAY, TO PHOTOGRAPH
THE ALTON LIMITED.
SEND A 20c STAMP TO GEO. J. CHARLTON,
G. P. A., C. & A. RAILWAY, CHICAGO, ILL.,
AND RECEIVE AN ILLUSTRATED PAM-
PHLET WITH FULL ACCOUNT OF THE
FIRST EXPOSURE MADE WITH THE RE-
MARKABLE MACHINE.

THE Locomotor Steam Carriage

IMMEDIATE DELIVERY



The following improvements will be appreciated by automobile purchasers: Low water alarm; four bearing engine entirely enclosed running in oil; extra heavy side steer; hand auxiliary pump; air pressure pump; auxiliary throttle; stop for brake lever; double acting brake; feed water heater; electric illuminator for gauges and water glass; heavy frame; roller bearings on rear axle; 30-inch wheels; option on tires, etc., etc.; Kelly Handle Bar generator attached to all vehicles without extra charge. Of the large number of our vehicles in daily use, not one has ever had the boiler scorched.

RUNABOUTS, STANHOPES, CONVERTIBLE TOURING CARTS,
DELIVERY WAGONS.

RECEIVERS BALDWIN AUTO. MFG. CO., - Connellsville, Pa.

DE DION-BOUTON *"Motorette"* COMPANY.

Sole American Agents and Licensed Manufacturers for
DE DION-BOUTON & CO., PUTEAUX, FRANCE

DE DION "MOTORETTES"



ARE THE STANDARD OF THE WORLD

Thousands of Satisfied
Owners say so

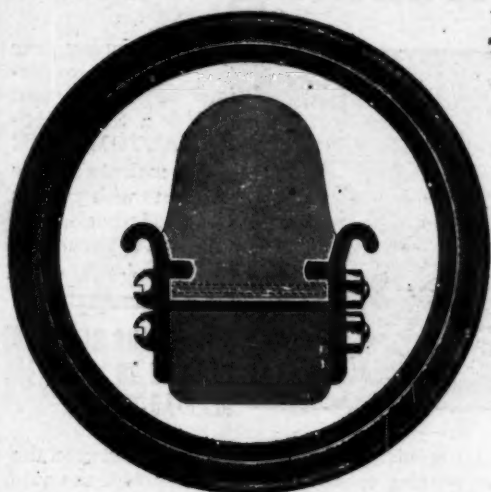
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De Dion-Bouton
Motorette Co.

Church Lane & 39th St.
Brooklyn, N. Y.

SEE OUR EXHIBIT AT PAN-AMERICAN

DON'T BUTT YOUR LUCK



Up against the Butt-End Tire problem.
The

Wheeler Endless

Solid rubber clincher tires save labor,
trouble and obviate all the ills conse-
quent to the use of the old style kind.

Write for the rest
of the story.....

The India Rubber Company & Akron, Ohio

"Reading" Steam Carriage

1901 MODEL NOW READY

**STRONG—SPEEDY
SAFE—SIMPLE**

SINGLE LEVER FOR STARTING OR REVERSING

Every Desirable Feature in a Steam
Carriage Has Been Covered.

32 Gallons Water Capacity.
8 Gallons Gasoline Capacity.
30 inch Wheels.

Side or Center Steering.
Long Wheel Base.

60 feet Heating Surface in Boiler.
Gasoline Controlled from Seat.
Proper Lubrication.

Auxiliary Throttle.
Auxiliary Hand Pump.



Adequate Engine Water Pump.

Automatic Fire Controller.

Flexible Running Gear.

Weight, Charged, 950 lbs.
Pilot Light.

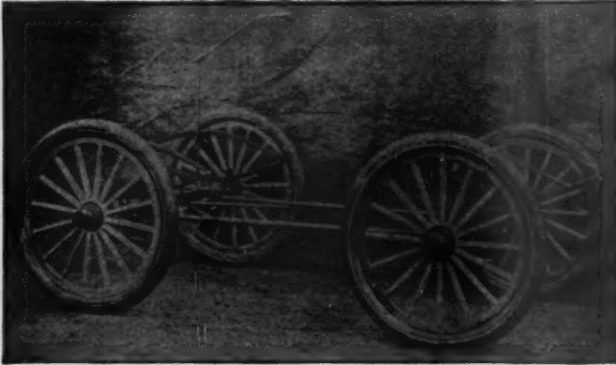
PRICE \$800.00

STEAM VEHICLE CO. OF AMERICA,

253 Broadway
NEW YORK

Agent for Great Britain: John L. Sardy,
Saracen Chambers, Snow Hill, London, E. C.

Automobile Running Gears



Get a running gear that is past the experimental stage and build a **SUCCESSFUL AUTOMOBILE**

We make two styles complete with springs and wood wheels, solid rubber or pneumatic tires.

OUR SPRING BLOCK BEARING IS SELF-ADJUSTING

and you ought to have it. It is made for revolving axles and is pivoted between the bearing and spring block, enabling the bearing to move free and easy with the axle always. Our catalogue tells all about it.

The Brecht Automobile Co. 1201 Cass Avenue, **St. Louis, Mo.**

Satisfaction

PARKSTON, SO. DAKOTA, June 4th 1901.
RALPH TEMPLE CO., Chicago.

DEAR SIR:—I received the last two wheels in good order and have sold them without any trouble. The **FAULTLESS** wheels are the best I have ever seen and is a good all around bicycle. I have enclosed an order for two more **FAULTLESS** bicycles and a draft for the amount of \$25.00. Ship the wheels at once if possible by Chicago, Milwaukee & St. Paul freight.

I remain yours very truly, J. W. BENTNER.

"They Were Shipped the Same Day"

"Our Price to Agents \$12.50"

RALPH TEMPLE CO. 293-295 Wabash Ave., **CHICAGO**

IN EVERY WALK OF LIFE

YOU NEED THE

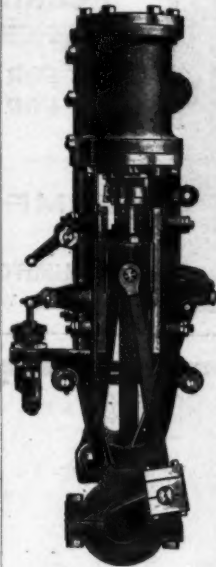


Mitchell
Motor Bicycle

A wheel for the business man, pleasure-seeker and tourist. No complicated mechanism to get out of order. Always under perfect control and does not require an expert to operate it. Every part built extra strong and fully adapted to motor bicycle requirements. Every machine guaranteed. Catalogue free.

WISCONSIN WHEEL WORKS

Racine Junction, Wisconsin



**"THE
Locke
Improved"
NO. 1 Engine**

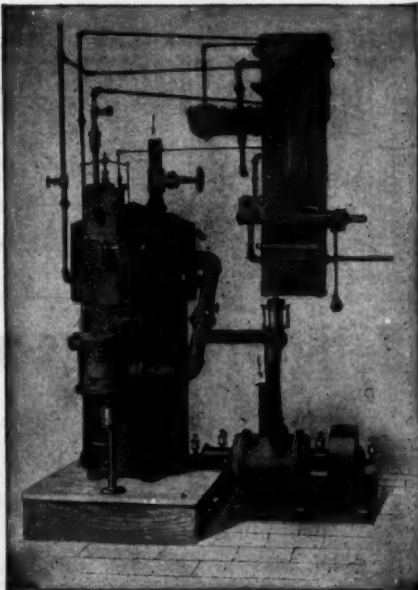
(4½ H. P.)

**MECHANISM SIMPLE AND
SERVICEABLE**

Each engine supplied with heavy asbestos cylinder jackets.

Engines carried in stock. Can be shipped on receipt of order.

**LOCKE REGULATOR CO.
SALEM, MASS.**



**THE
Garland**

**AUTOMATIC GAS
GENERATING APPARATUS**

FOR AUTOMOBILE FACTORIES

**Any Capacity
Great or Small**

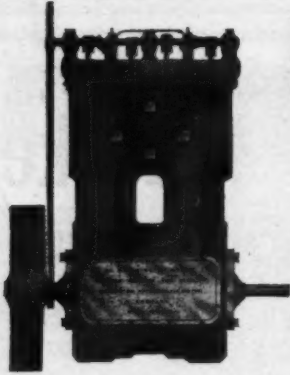
In use in steam laundries with small requirements and packing houses using 300 gallons of gasoline daily.

**Gas of required density without use
of supplementary air blast.
No condensation.
Vaporizes every particle of oil.**

We shall be pleased to figure on the requirements of automobile manufacturers.

GEO. D. GARLAND, - 43 S. Clinton St., - CHICAGO, ILL.

ADVERTISEMENTS.



Remington Standard Motors...

FOR LAUNCHES
FOR AUTO'S

NONE BETTER
FEW COMPARE

A Good Motor with a Good Name

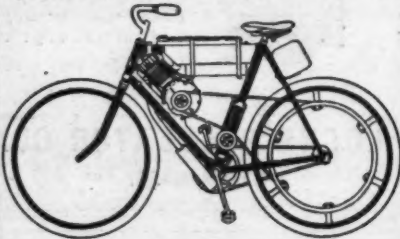
SIMPLE, QUIET, PRACTICAL

REMINGTON AUTOMOBILE & MOTOR CO., - Utica, N. Y.

Write us for catalogue of complete automobiles.

WORLD'S RECORDS

1 mile—1 minute, 22½ seconds
5 miles—7 minutes, 05½ seconds
were made at Buffalo, Saturday, Aug. 17,
on the Stadium track on the



AUTO-BI

with our regular 1½ I. H. P. motor

PREVIOUS RECORDS

1 mile—1 minute, 23½ seconds
5 miles—7 minutes, 10½ seconds
with a motor three times the weight and
rated at double the power. You see we
continue to occupy our regular position as
motor cycle makers—that of leader and the
maker of the best—the AUTO-BI.

E. R. THOMAS MOTOR CO., (Inc.)

103 Broadway - - - - - Buffalo, N. Y.

Poor Tires

vs. Good Tires

This case is called every day in the
Court of Public Favor. The decision
is always given in favor of "Good
Tires;" at the head of this class stands

"Fisk Tires"

The Witnesses are Fisk Riders; the
Judge the general public.

FISK RUBBER CO.

Chicopee Falls, - - - Mass.

BRANCHES:

Springfield; New York; Syracuse; Buffalo;
Detroit; Chicago, 54 State St.
San Francisco, PHIL. B. BEKEART, 114 2nd St.
A. F. SHAPLEIGH MFG. CO., St. Louis, Mo.
Distributors for Central and Southern States.



They Help Your Sales and Stay Sold

FULLY GUARANTEED. The only wheel specially designed
and constructed for Automobile uses. Neither wire or wood are
equal in strength. For descriptive folder address

MIDGLEY MFG. CO. - - COLUMBUS, O.

Patented October 30, 1900.

Western Sales Office: K. FRANKLIN PETERSON, 166 Lake St. CHICAGO, ILL.

ADVERTISEMENTS.



C. S. KNOWLES, 7 Arch St., Boston.

ARE MANUFACTURED BY

Kokomo Rubber Co.

KOKOMO, IND.

FOR SALE BY:

H. W. COOLIDGE & CO., 135 Lake Street, Chicago.

BORN & CO., 82 Broad St., New York City.

LEAVITT & BILL, San Francisco.

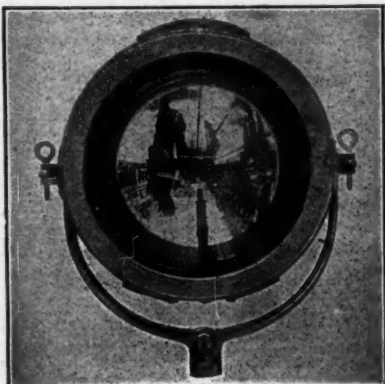
E. H. CRIPPEN CYCLE AND SUPPLY HOUSE, Los Angeles.

MITCHELL, LOUIS & STAVELAND CO., Portland.

E. T. WEIANT, Denver.

To give a good light you need a reflector or better still a lens mirror. The

**RUSHMORE
AUTOMOBILE
SEARCH LIGHT**



has a lens mirror. You don't have to clean it every time you light up. Turn this up side down and see how perfect it is.

THE ADAMS-MCMURTRY COMPANY,

114 Fifth Ave. and 7 East 28th St. NEW YORK CITY



G & J TIRES

FOR AUTOMOBILES

are detachable, double tube tires. An occasional puncture is inevitable in any tire. Any one can repair a G & J Automobile Tire easily and permanently.

G & J TIRE CO.

INDIANAPOLIS, IND.



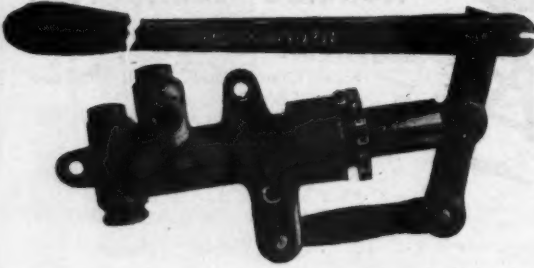
**"THE DAYTON"
BURNER**

(Patent Applied For)

One-piece cast iron Burner. Can't warp or break; will not burn black or blow out. Pilot light burns constantly while carriage is in use. Generator and Pilot Light can be attached to other burners. Send for descriptive circular.

The Dayton Motor Vehicle Co.
DAYTON, OHIO

Time, Trouble, Money Saved!



This, the "XANDER" AUXILIARY HAND PUMP will accomplish, easily attached, fill the boiler in two (2) minutes. only pump entirely independent of feed pumps on the engine. Cheap reliable, weighs only five (5) pounds, easily attached to any steam carriage. THE "XANDER" STEAM ENGINE, two cylinder, best on the market. Automobile parts, boilers, first-class machine work, etc. Agents wanted everywhere. Write to-day to

THE XANDER MACHINE & SUPPLY CO.
Reading, Penna.



Advance Drills...

FOR
BICYCLE
REPAIRERS

Well made,
Light draft,
Continuous auto-
matic self feed.

14 Sizes
and Styles

\$6.00
TO
\$85.00

NO. 12,
ADVANCE
125 LBS
\$10.00

Special discounts to
bicycle repairmen.

EVERY
DRILL
GUARANTEED

THE SILVER MFG. CO. 325 Broadway
Salem, Ohio.

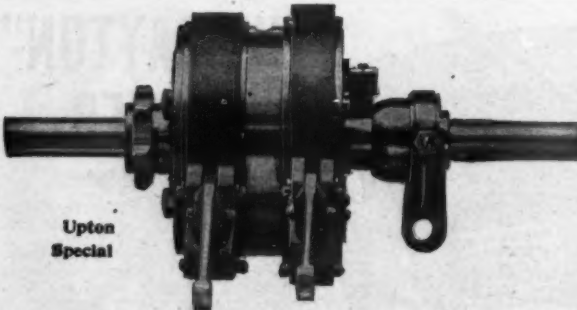
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FROM THE CHICAGO
AUTOMOBILE EXHIBIT

THE MILWAUKEE AUTOMOBILE COMPANY exhibited: The largest steam vehicle—The thirty-five horse power truck. The fastest steam vehicle—The mile-a-minute racer. The only steam delivery cart—600 to 1000 lbs load capacity. The largest number of steam vehicles—Eleven, not two alike.

"The Milwaukee" has an air pump working on the cross-head of the engine. It maintains the required air pressure at all times, and unless you are anxious to work up your muscle with a hand pump, you will before buying any other steam carriage, inquire about this, of the

MILWAUKEE AUTOMOBILE CO.
19th St. & St. Paul Ave., MILWAUKEE, WIS.



Upton
Special

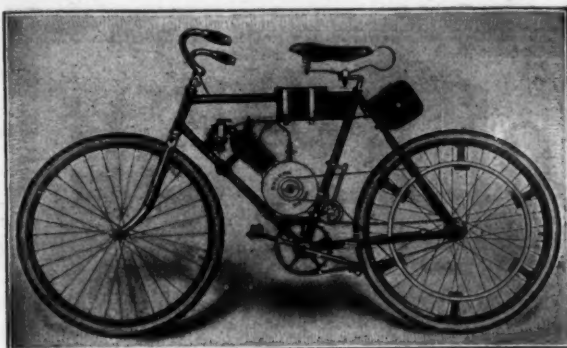
Transmission Gear

TWO SPEEDS, FORWARD
AND A REVERSE

Satisfaction guaranteed
Write for circular

UPTON MACHINE CO., - - 17 State Street, NEW YORK

ADVERTISEMENTS.



THE MERKEL MOTOR-CYCLE

Simplest on the market.

SINGLE LEVER CONTROL

Speed variation 4 to 25
miles per hour.

PRICE

\$200

Agents wanted. Write for Catalogue
of Motor Cycle and equipment.

MERKEL MFG. CO.,

Dept. A. . . . Milwaukee, Wis.

SHELBY STEEL TUBE CO.
CLEVELAND
NEW YORK. CHICAGO.

Operating a STEAM WAGON should be
a PLEASURE and not a LABOR.

No
More

WATCHING WATER GLASS
BURNT-OUT BOILERS
KNOCKED-OUT CYLINDER
HEADS

With Our

Automatic Electric Boiler Feed Regulator

Two dry batteries operate one year. Simple,
durable, easily attached, fully
guaranteed. They Never Fail

PRICE \$18.00

**THE RELIABLE AUTOMATIC
BOILER FEED COMPANY**

Room 58, 39-41 Cortlandt St.,
New York.

AGENTS WANTED

A Foot- Power Lathe and Outfit of Tools



Our No. 5 Lathe is a right and left-hand
screw cutting lathe, swings 11 inches on
face plate; 34 inches between centers. Is
back-geared and has hollow spindle. Has
set-over tail-stock and swivel tool carriage
for tapering and boring.

SPECIAL OFFER!

The list price of No. 5 lathe is \$90. We
will furnish the lathe with set of slide rest
tools, three lathe dogs, 6-inch chuck with
two sets of jaws, lathe arbor and set of Morse
twist drills $\frac{1}{8}$ inch to $\frac{1}{2}$ inch by 32nds, in
all amounting to \$110, for \$90 cash. Goods
carefully boxed and delivered on board cars,
Rockford. This gives the best lathe made,
with full equipment of tools, for less money
than you can buy an inferior machine.

Full Descriptive Catalogue Free on Application.

W. F. & JNO. BARNES CO., 233 RUBY ST.
ROCKFORD, ILL.

A Bit of SENSE

True merit always did and always will out-weigh a guarantee of any kind. We place the **DASEY PLUG** before the trade strictly on its merits—and no other way. A good plug speaks for itself by the results given—and an empty guarantee on paper only, is unnecessary. We have used our plug on engines ranging from 1 to 30 h. p. and



have yet to hear of **FAILURES** either through short circuiting or by breakage of porcelain—Something which, in our candid opinion, no other plug makers can say with truth.

Our price is not exorbitant, neither is our plug a marvel, but it is good and can be depended upon to give better

and more lasting results than **OTHERS** we can name. Our prices are \$2.00 each, singly, and \$13.50 in lots of one dozen—net cash with order. We have bicycle motors in 1, 1½ and 1¾ h. p. sizes; water jackets in 4, 7, 10 and 15 h. p. sizes; running gears and all parts necessary for constructing steam or gasoline vehicles. We represent the complete line of Dow coils, batteries, etc., suitable for all forms of gas and gasoline engine ignition. These are the **best by every test** and we can prove it to our competitors or the trade upon request.

THE P. J. DASEY CO., 160-162 Washington St., CHICAGO, U. S. A.

HOW MANY Un-Morrowized Bicycles

ARE THERE IN YOUR TOWN?

As a matter of fact there is no good reason why every bicycle should not be fitted with a Morrow. Those that remain un-Morrowized constitute evidence that there is work for you to do—work that will add to your profits and to the pleasure of the rider. "Go after" them.

ECLIPSE MFG. CO. :: :: ELMIRA, N. Y.

